THE *SHIFTING* NEXUS OF GLOBAL AGRICULTURE

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Session 2:

Investing in Agricultural Infrastructure

Investing in Agricultural Infrastructure (Remarks)

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It is a pleasure to be here with you this afternoon and certainly it is an exciting time, as we see what is going on in the world. We are blessed as a country to have the envy of the world, to have the infrastructure that we have today, and that it continues to move and be available for the movement of commodities, goods, services, and people throughout our communities, around our cities, and around the world each and every day.

Informa Economics is a commodity research firm out of Memphis, Tennessee. I certainly appreciate the opportunity to be here with you today and bring greetings from Memphis.

As I said, U.S. infrastructure is the envy of the world and it has been doing its work, but the infrastructure just sits there. Speaking of sitting there, for those of you who are not familiar with baseball, there is an All-Star Game tonight. Last night we had an electrifying home-run derby.

It might not be so electrifying when I read this from *The Wall Street Journal* this past weekend about America's pastime. In any given year, roughly 70 million people will attend major league baseball games. A lucky handful will be treated to something unforgettable – a no-hitter, a walk-off grand slam, a player stealing home. Many more fans will see towering homeruns, late-inning rallies, and diving catches.

But there is one thing every single fan who buys a ticket is 100 percent guaranteed to see at a baseball game – a bunch of grown men standing in a field doing absolutely nothing. [laughter] Look at this: "Baseball is remembered for its moments of action, but it is no secret that such moments are fleeting."

But how much actual action takes place in a baseball game? Well, according to *The Wall Street Journal* – they looked at three games- what you see as a fan is 17 minutes and 58 seconds in a game. Now how much have you all enjoyed a game of baseball? Within a three-hour timeframe, that is what you're seeing.

But that is what our infrastructure is. It is sitting by, waiting for action to take place. And it has been serving our economy, our world, and our people for decades. Some of you have seen a lot of investment over time.

The question could come up. What inning are we in with our infrastructure? That would be a fun discussion to have and think about – what the count looks like throughout today. I thought that was kind of apropos, as we think about where we are with our infrastructure. Here we are with our All-Star Game tonight and who is on what side.

But infrastructure is certainly a very important feature in all of our minds. One of the key features about infrastructure is that *freight does not vote*! That is one of the underlying features with anything that we see. So many times what we see in infrastructure is that freight really does not have that voice, but transit does (and we can talk about that later).

Looking at the United States, there are a lot of things going on. Today we look at the United States and transition to look at South America for comparison, because I get more questions about comparing the United States to South America than anywhere else. We have already heard some comments about Russia, Ukraine, Africa, and other places and we can talk about that.

Here is a quick outline as we go through here this afternoon: looking at the impact of U.S. agriculture, infrastructure on U.S. agriculture, the key transportation and infrastructure issues, the movement of grains and soybeans and oilseeds within and around the United States and connecting the world with our grains and our commodities, then looking at South America, and wrapping it up with a summary and conclusion.

First, let's take a look at the impact of infrastructure on U.S. agriculture. This is very telling and very exciting. We were commissioned to do some work about a year ago in looking at what infrastructure does for agriculture by moving U.S. corn, soybeans, soybean meal, DDGs, vegetable oil -- all our product -- through the system beyond the farm gate.

When we think about moving it through just in transportation, what we're looking at is of significant importance to the U.S. economy. Consider it is about 1½ million jobs in the movement of commodities across the system, more than $352 billion in U.S. output, $41 billion in labor earnings, and then we wrap it up and look at over $74 billion in value-added, just from the transportation of U.S. agriculture.

That is very significant, because it goes into the far reaches of our economy and it is very pervasive in the way it moves. It makes sense. Everybody eats and we also use a lot of our commodities for different industrial purposes, certainly with renewable fuels - we know that story very well and it is telling as we look at it.

But suddenly looking at the framework structure then, what does this look like? What is the construct we operate within? The reality is, yes, our infrastructure has served us well for five, six, seven, ten decades when we start thinking about the infrastructure we have today. But how well will that infrastructure be for the next five years, ten years, three decades, four decades down the road? Quite frankly, some of our infrastructure that's seven or eight decades old will be asked to do the same thing for the next six, seven, or eight decades.

Wait until I show you a couple of charts from the Army Corps of Engineers. It will blow your mind about what our infrastructure has to do in the future with what we have today. Here is the construct. When we have infrastructure problems, that leads to inefficiencies. That comes in multiple forms and that is where they are looking at trying to deliver the same volume with less capacity, less capabilities across infrastructure that has issues and problems, whether it is crumbling roads, bridges (falling bridges, we've seen that recently, have we not?), or certainly with locks and dams and dredging issues that we see inefficiencies abound all the more.

If you are a merchandiser you are not trading grain, you are trading freight. If you start bringing in the economics of grain, someone who has a supply here in Kansas and someone else overseas who wants that, until you introduce transportation there is no value. It is when you introduce transportation that there is value. In fact, there is cost sitting at that farm. Transportation begins to bring the value back to the farm gate.

When we start looking at this, inefficiencies lead to that lower effective transport capacity being able to move the same volume but with less capabilities overall. Looking at this, it just leads to higher freight rates. It is a supply-and-demand function when we start working through there. Lower capacity utilization equals higher freight rates.

Last, when we think about this from a producer standpoint, higher freight rates for a farmer leads to lower farmer returns. For that farmer with lower farmer returns, what kind of investment decisions will he be making in the near run, but also over the long run? What

is the type of investment they will have on their farm or in their enterprise as they look at their expansion, what type of crops they are going to produce, what type of technology they are going to adopt? Infrastructure and transportation go hand-in-hand with production agriculture and certainly farmers understand that, as they see basis adjust accordingly when there is interruption within the infrastructure.

Let's take a look at some of the key transportation and infrastructure issues that are out there today. Look at two particular areas of Table 1. This is moving toward export market position within the United States. It comes down to two particular areas. It comes down to locks and dams and to dredging our channels to make sure that ships and equipment can access elevators, access ports, access terminals. You have to be able to come in and be efficiently loaded, to be fully capable of the capacity that is available to them. Our locks and dams have a lot of issues.

Table 1
Key Infrastructure Issues

Infrastructure	Project Description	Cumulative Outlays ($ millions)
Inland Navigation Lock and Dams	Mississippi River Lock 20, 1,200 foot Lock Addition + Lock & Dam Rehabilitation	$311.1
	Mississippi River Lock 25, 1,200 foot Lock Addition + Scour Repairs & Rehabilitation	$429.9
	Ohio River Olmsted Lock & Dam Construction and Lock 52 and Lock 53 Removal	$2,044.0
	Ohio River Markland Lock Major Rehabilitation	$35.8
	Illinois River LaGrange Lock Addition	$320.9
	Illinois River LaGrange Lock Rehabilitation	$78.8
Channel Dredging by Army Corps of Engineers District	Galveston	$1,230.8
	Mobile	$677.8
	New Orleans	$2,322.5
	Portland	$288.0

What you don't see on the table is rail because they are able to invest their own capital back into their network. High capital costs, mind you, takes a lot of investment, but it would certainly bring in $20 billion in most recent years. Railroad is able to do a lot of things that folks in an inland navigation system or at a port are unable to do because they are able to invest in the infrastructure themselves. Barges have a fuel tax - for every gallon of fuel they buy, they are paying 20 cents into a federal waterway trust fund.

In this table, you see a number of projects of locks and dams that are very important to agriculture. There are several others, but here are the key ones. What you see is several billion dollars represented there. One in particular called the Olmsted Lock and Dam is the poster child of infrastructure overruns, although the big dig in Boston could probably follow right behind this. Certainly work on the Olmsted Lock and Dam on the inland navigation system continues. It was first authorized in 1986, was first appropriated in 1988, now it is supposed to be done by about 2020, and we probably won't see it open until 2030. The next projection for the overrun, which originally was a $775 million project, is now over $2 billion and fast approaching over $3 billion – just to put in one lock.

We have a giant sinking hole in a lot of areas in our lock and dam system. Certainly you can see a lot of areas. Look at the bottom here for different port areas that require investment for dredging. Just keeping up with the dredging, we have a trust fund – the Harbor Maintenance Trust Fund – that has some $7 billion sitting there to be used for dredging and we are not drawing it down. We had the same thing happen on the Inland Waterways Trust Fund that had several hundred million dollars and the industry has been successful getting the government to spend the money down on different projects.

These are the types of projects we are looking at now. There are a number of things on the horizon. One of them is very far south at the equator, if you think about the Panama Canal expanding its locks and dams. Many of you have heard about this ad nauseam, but it is something to keep looking at and thinking about.

What does this means for agriculture? What does this mean for bulk commodities that are moving through the system? Also, what does this mean for containers? Most people think containers; we think a lot about bulk, because that is how most grain moves in this country.

You look at the Panama Canal that is going to get a draft that is going to be operational at 50 feet from its current 39½ feet. Some of it is going to be longer and wider ships can go through there. It was supposed to have been done in 2014, but it won't be until 2015.

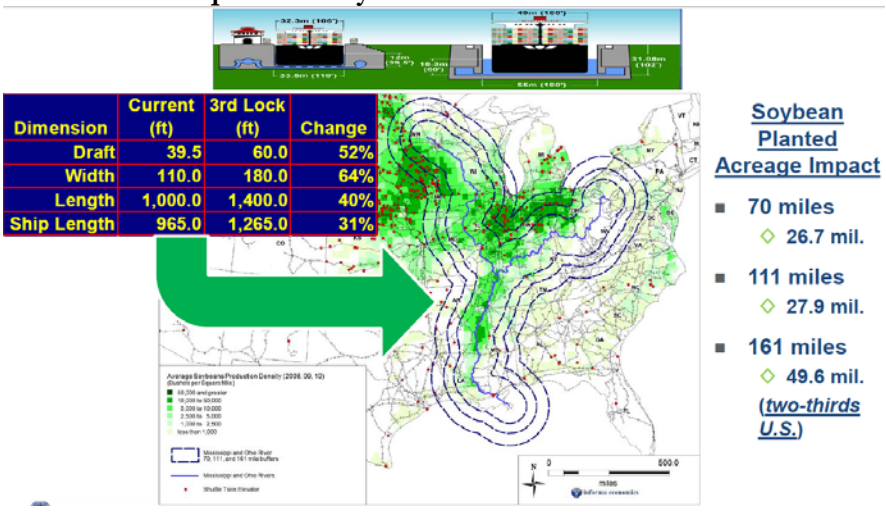
Some work we did for the Soy Transportation Coalition a couple of years ago looked at improving the efficiencies of loading vessels. What if we fully utilized the Panamax Ships? Or even small Capeside ships on the lower Mississippi? If we could go from loading 39½

feet and load to the 45-foot draft that is presently the draft limit on the lower Mississippi, what can we see as opportunities? Today we are looking at a draw area for the Mississippi River system that is about 70 miles, actually it is more like 35 miles and you are trying to compete against the railroads and you have 35 miles between you, so we have 70 miles for the draw area for the river.

If you start loading those Panamax Ships to their full capabilities, you can add anywhere from 7,000 more tons. Right now a Panamax Ship out of the Center Gulf goes with about 57,000 tons of corn or soybeans or a combination thereof. If you see it adding more volume with the same vessel, you get better economies of scale. You start drawing out your draw area for that vessel, because the cost of that vessel goes down. Now you are able to go from 70 miles to 111 miles. If you go from a small Capesize vessel, say, a 97,000 dead-weight ton vessel or a little bit larger, then you are looking upward of 11,000 to 13,000 more tons on that vessel, which takes you up to 161 miles away from the river.

Looking at Map 1 the red dots are railway shuttle-train loading facilities. Where is that breakeven? What you do is, instead of having 27 million acres of soybeans that are tributary to the river, you go up to 28 million acres, and then up to 50 million acres. That is more than two-thirds of U.S. soybean production area. What does this mean just looking at the cost of using vessels with more volume? There are a lot of other things that can emerge and make that economical or not, but this is the kind of construct we have with our infrastructure to date.

Map 1
Modal Developments Beyond the U.S. Borders: Panama Canal



Are we in a position to compete in this kind of environment, thinking about dredging our ports, keeping those accessible, and looking at our locks and dams and feeding the system, and keeping the very highly competitive system going forward? What are those cost savings to those soybeans growers? What is derived from these different projects here? Infrastructure is very important.

One, you are going to get the improved reliability in the delivery time of those commodities to the market position. It is about getting to the market position. We've already heard from the previous panel that infrastructure has been very important in different areas. Certainly, you get the reduced travel time and you get different transit costs within that.

Go back to that framework we had. As you get inefficiencies within your infrastructure and transportation system, the costs start mounting throughout. Now we start reversing that formula. We start seeing some accrued benefits that come back into the system.

That improved efficiency is gained because you have different larger, efficient ocean-going vessels that start calling to port. You have better use of those pieces of equipment and certainly that gives you better efficiencies.

Here is the other rub. You get some potential reassignment of movements by mode. Perhaps instead of going by one mode, you switch over to another and start seeing some different benefits accrued. Certainly, that could see some job reduction in some cases, because you are going back to higher, better use of mode movement though the system just by physical count.

What does this look like in terms of the United States and what this means to agriculture overall in the savings and the opportunities that come through?

These are annual outlays or annual savings, when we started investing in our U.S. infrastructure. Our infrastructure has served us well for many decades. But now, we are at the point it is more than just wrinkles. It is more than just a few scars. These are hip replacements. These are knee replacements. We are having to call in the extra pitchers. We are having to go deep into the lineup to start seeing some of these things being able to withstand what we are requiring of our infrastructure today.

By all counts, if you talk to many folks, by 2035 most of our modal capabilities will be fully constrained and at capacity. Looking at outlays just on the construction side of $470 million a year, you go all the way across here, you get quite a bit in earnings, quite a bit in output through the economy, quite a bit of employment for construction and other things, and then the different value-added that comes just from construction (Table 2).

Table 2
Annual Summary Investment Outlays and Returns for Soybeans and Grain Industries

Description	Impact Type	Dollar Value (million)	Economic Impact			
			Earnings (million)	Output (million)	Employ-ment	Value-Added (million)
Infrastructure Outlays	Construction	$467.2	$400.8	$1,176.5	7,927	$615.2
Supply Chain Impacts	Cost Savings	$145.9	$8.9	$40.3	185	$15.5

But look at the savings that gets accrued back through the supply chain. We are talking about the supply chain. We still think about the costs that are accrued. These are savings of about $146 million annually. You are looking at earnings that are about $9 million every year, $40 million in output, and 185 jobs. That doesn't seem impressive. When we start thinking about better efficiencies, you don't have to hire or retain as much equipment or utilizations. You don't need to employ as many people. That could be a negative to some people, but we are talking about being more efficient and more competitive.

Trying to get truck drivers for any of these transportation positions is very difficult. It doesn't hurt that the Bakken and Eagle Ford formations are certainly pumping out a lot of oil and they pay for good drivers. Look at the competition there is among the railroads. You guys are very impressive in trying to attract labor.

Looking at some of these long-term projects of the river system, if we get this all done, this will be great. But you know what? We have a problem. We are going to extra innings and we are running out of support. Our infrastructure is several decades old. Let's take a look at the Army Corps delivery schedule for some select locks and dams. All of these projects I'm showing you on Chart 1 and Chart 2 are authorized by Congress. You have work done to them either through major construction and major rehab or some new

construction – walk extensions or a new walk next door to it or another chain rope, if you will.

Chart 1 shows the Army Corps Project Completion Schedule for Major Rehabilitation. I have four locks on the left side, whether it's on the Illinois River, on the upper Mississippi River, or on the Ohio River. Going from left to right are years. Those are years of decades that most of us in this room will never see. In fact, you go through those years –in some cases, you're looking at 2080 for some of those projects to be completed. That is the delivery schedule by our professional engineers at the Army Corps of Engineers.

Chart 1
Army Corps of Engineers Project Completion Schedule
Major Rehabilitation

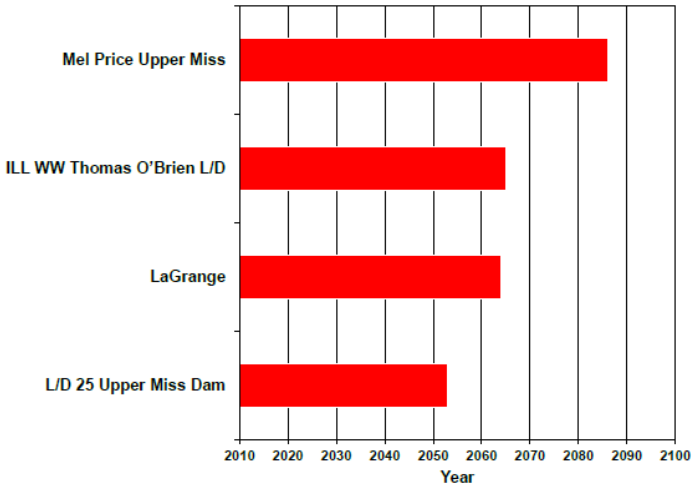
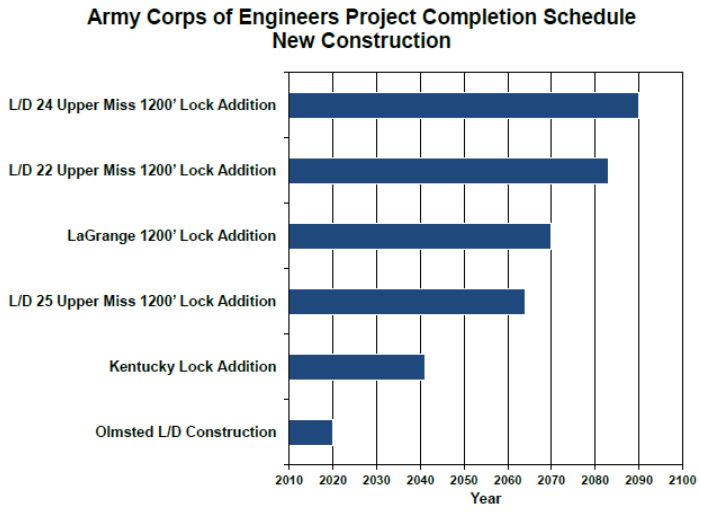


Chart 2
Army Corps of Engineers Project Completion Schedule
New Construction



Let's just take another look at these new construction projects (Chart 2). They are much longer, when you think about delivery. It takes a lot of effort, especially with the way we fund U.S. projects on the inland river system. We fund projects through Congress. They appropriate money, if they feel like it and there is money available, how do we take care of this problem? In the meanwhile we are not raising any more revenue the way we're structured today. When you start looking at these projects, every year Congress has to appropriate money ***for one year at a time*** … every year. Oh, let's stop for a couple of years. What do you do with your construction that's down there in the hole, digging or pouring concrete? They pull out and then one day Congress says, "Hey, it's time to come back. We have some money for you to come back in."

That's where you start seeing your cost overruns. How many of you are going to invest in your physical plant or invest your capital just one year at a time without any kind of thought of when it's going to get done? That's not how we taxpayers pay for things on the inland river system. That's a waste of money. We're seeing this over and over again. It's been going that way for many years. Certainly that's a challenge going forward.

In the meanwhile, our infrastructure of locks and dams are several decades old and they are more than just needing a band aid. They need a full replacement. The backlog of

maintenance continues to escalate. If you look at the emergency repairs, it goes up every year, the unscheduled availability of our locks and dams in this country.

What does the industry need? The industry needs reliability and assurance the system is going to work. We can do this through maintenance. Just maintenance on our locks and dams – operations and maintenance – it's that maintenance part that keeps falling behind.

It's not a full solution. If we have a delivery schedule that is several decades away from getting done, how in the world do we think we are going to get there when we are falling behind on maintenance? Right now, if you look at the Illinois River System, it's about $600 million backlogged in maintenance – just on that system.

If they were to get underway tomorrow and put in $600 million in that maintenance to bring all the major components up to ensure reliability of the system, they can buy down the risk of that system and have savings of $15 billion over the next ten years. That is very significant, because reality is that lock and dam system continues to get older and older and we're a major catastrophe away from something happening. It's about buying down the risk.

If there is a failure at just the right spot, we see diversion to other modes. You may think that's great for all the other modes. The reality is when we think about the volume of some 500 million tons in certain areas of the river system that moved through it, how do we move that through with other modes that go through the system here?

Let's consider one barge is about 1,600 tons, or 53,000 bushels of grain. One railcar is 110 tons, or 3,670 bushels of grain. One truck is 26 tons, or just under 1,000 bushels of grain.

Then consider a 15-barge tow on the Illinois River. That is about 216 railcars, or about 1,050 trucks that go down the road. If you were to ship down the LaGrange Lock on the lower Illinois River – the last lock up the Illinois River – just for a 90-day period at peak harvest, you are talking something very significant. You are talking 341 barge loads of soybeans, on average, the last few years. That is 5,000 railcar loads of soybeans, or 21,000 truckloads, to be moved somehow, someway.

The reality is we would see a diversion, you'd see the basis drop around there, and you'd see the market start to correct itself. The reality is it gets to be very problematic.

Go back to the farmer investment decision. What kind of reaction will the farmer have back at the farm? It's not just grain, right? You have your fertilizers, your diesel, your chemicals, everything else moving up the river.

If you fly through O'Hare, you want a good system, because, during the middle of winter, where do they get their deicing chemicals? It comes by river. Some of their airplane fuel comes by river. So, if you have to go through O'Hare and you're United, I wish you well. Think about those locks and dams the next time you fly into O'Hare. [laughter]

It is not that all rivers are created equal. Certainly we have the Missouri River that flows into the Mississippi River. In reality, this should be the Mississippi River, or it should be the Missouri River down by Memphis where I am if you look at the big flows. The Missouri River supplies about 60 percent of the water that flows past St. Louis on the Mississippi River and keeps going down. The Ohio River contributes another two-thirds of the water that goes past Memphis. So the Missouri River is very important on the upper stretches here. Certainly last year was very important.

Let's look at Memphis. In 2011, we had the epic flood, according to the Army Corps of Engineers. Here's the river gauge at Memphis for that time span. You went from 50 feet over gauge in Memphis in May 2011 and last August we went to a -10 feet. That is a six-story building floating down the river – a wall of water that is cruising down that massive ditch we call the Mississippi River drainage basin.

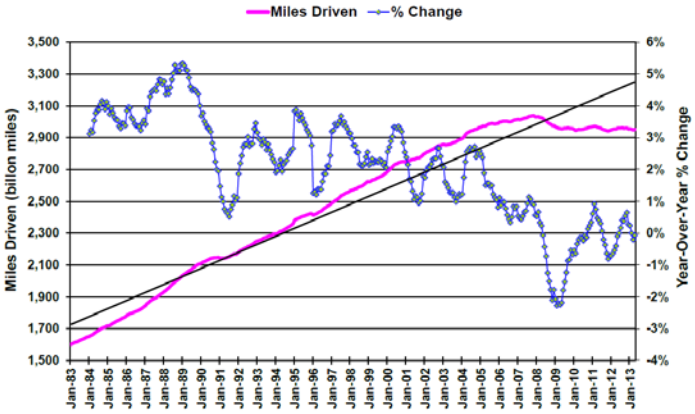
It is not that all rivers are created equal, as I said. We have rivers like the Missouri, upper Mississippi, Illinois, Ohio, Tennessee, and several other tributaries that contribute. All of them have different features and functions. Certainly we are still in the midst of a drought here in the Missouri River. We are 20 percent below the water levels we should be for normal.

We still have some issues to go through and consider what we see for in the long term. A lot of that comes back to water management and how Congress allows the Army Corps to manage the river system. It all comes back to Congress when we think about who is the umpire of this. That is the challenge. The rules seem to be so archaic. It is hard to play, because the boundary lines seem to change regularly in that regard.

Take a look at funding infrastructure. When we think about funding the highway bill, the road bill, or the intermodal bill, it's really the highway bill. How do we fund that?

Really, it's all about what is displayed in Chart 3 – how many miles we drive in this country, how much fuel we purchase, and how much tax we pay at the pump. If you look at the pink line up there, we peaked on our driving in this country in 2006 and we've been falling backwards and holding steady ever since.

Chart 3
Annualized Miles Driven by Month



Look at the gap between that trend line and that pink line. That is where we have the issue with our highway trust fund. We do not see the revenues there. Not only do we have less driving for a number of reasons. People have changed because of high fuel prices. Certainly the trucks that are driving on the road are driving less miles as we're putting more truck equipment onto rail and taking advantage of domestic intermodal transportation. That has been very successful but it is also very efficient in that regard.

Then we start looking at the different types of cars and CAFE standards where we're getting better fuel mileage. All of it is very negative in the way we fund the different transportation systems we have in our economy. You throw in a disastrous recession that we're still slogging out. We still have people not really driving and moving through the system.

So you have a number of things, whether it is on the river side of things or it's on the highway. It's all about connectivity. That highway bill funds local roads, local bridges, and also funds transit to a very high tune. When you think about this, all transportation infrastructure is very local at its core. Because if you can't get off your farm, you can't get to the next place of enterprise and move it into the economy, so you have some difficult

challenges. We have certainly been seeing that in the area of roads and bridges, especially bridges in this country at a very local level.

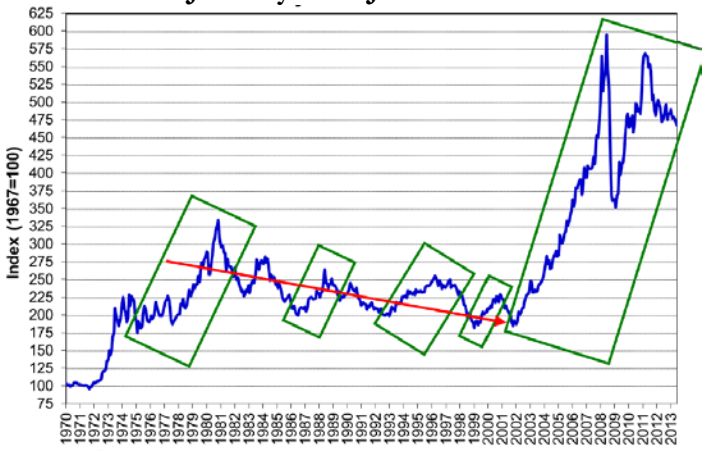
We talked to some farmers who said, "Hey, that bridge is very deficient. They are probably going to close it. It could shut down and you'd have to drive an extra ten miles."

The response is, "Well, so what?"

We sat down and started going through ten miles times how many trips they do during harvest and you double that for the backhaul. When you add that up, that's a lot of wear and tear, that's a lot of diesel, that's a lot of time, and you might need more equipment. It starts to hit home. It hits the pocketbook. Those are some of the realities we look at, as our infrastructure falls further and further behind.

Last, in thinking about our infrastructure, we like to use Chart 4, which shows commodity prices, the raw ingredients. The cost of those things was in a deflationary mode for a long time. In fact, we had so much supply. It is all about supply management and it didn't matter what the cost in the system was. By 2002, cost became important, because all the prices for those imports skyrocketed, as shown in the chart. Yes, it corrected a bit, but they are still very high. But here is the point, in this chart, from my perspective, transportation departments were told, "Find ways to be more efficient, because we can't absorb all that cost. We need you to do something about that."

Chart 4
Monthly CRB BLS Spot Index
January 1970-June 2013



Now we start eking out as much cost as we can through the logistics function, it gets challenging every single day. Now they have to contend with an infrastructure that is

crumbling and falling apart and having issues to move over from one day to the next. Those are some of the constructs when you start adding in the challenges of funding and fixing infrastructure and finding creative ways to do that.

I have to tell you, working with a lot of local municipalities, counties, townships, coming in with a plan to either bond finance or bring private money, it all begins to be political. Everything is political.

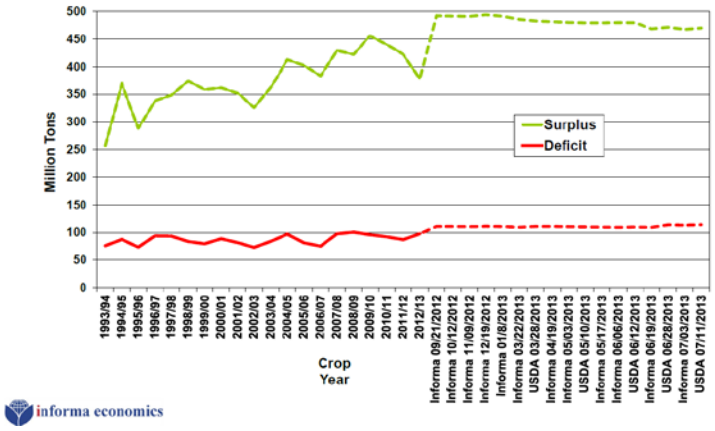
How do you start working with people to move things through when there are people willing to pay for infrastructure? It takes a lot of time and it takes a lot of work to move through these things. But it has to start very local to work its way up. To get that message very clearly defined for people to see through there.

When we look at the transportation of grain and soybeans, it is a very simple process, correct? No, there is a lot of movement that takes place. Certainly, just looking at this map, trying to move from the area of production to different areas of consumption and moving on to the next order of consumption, there are a lot of different buckets and a lot of different things that need to be filled. At the end of the day, if we don't have what is a supply, it doesn't matter what the demand is. Because we talk to a lot of our energy clients or we talk to a lot of other people in different investment areas, they don't quite understand that agriculture is an annual event and every year is different, as we all know in this room. If you are to have an adequate supply that can be moved it is not a guaranteed event.

In thinking about production, when we look at the country we ask, "Where are your holes, or where are your surplus areas, where are your deficit regions?"

Just looking at surplus states or surplus regions, looking from a production standpoint, Chart 5 is a development from Informa, using USDA's numbers of where we see the different production numbers combining all the commodities together, converting them to times, so we can book them to carloads or into barge loads, or into truckloads. What you see is roughly 500 million tons of production in the surplus areas and those are areas that produce more than they need in the local areas and they can have the surplus available as out shipments.

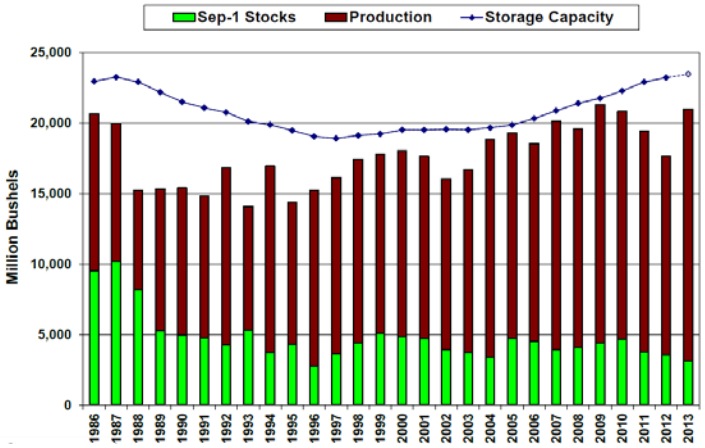
Chart 5
Crop Production by Surplus and Deficit Regions



Deficit areas, quite interestingly, have been holding in there. Think about your deficit areas as a giant smiley face in the United States coast to coast, going down from the East Coast to the Center Gulf up to the West Coast. Those are your deficit areas. Iowa is deficit. All those ethanol plants took all the corn and then some from the local area. But that is another story. But we start looking at what's going on here: It's about where is that supply. You have to have a supply before you can move anything and that's the important feature here.

Certainly, when you look at grain storage and capacity, we got decimated by last year's crop (Chart 6). We were going gangbusters in expanding our storage capabilities in this country. I heard many people already talk about storage and investing heavily in those different countries. But we started looking here. Right now where is the incentive to invest in storage when you have such low utilization rates? When you take September 1 stocks of all grains and soybeans, add on the fall harvest of corn, soybeans, and sorghum, now we're starting to get back to where we were in 2009, unless of course we get a little bit better bushels.

Chart 6
Grain Supply and Storage Capacity



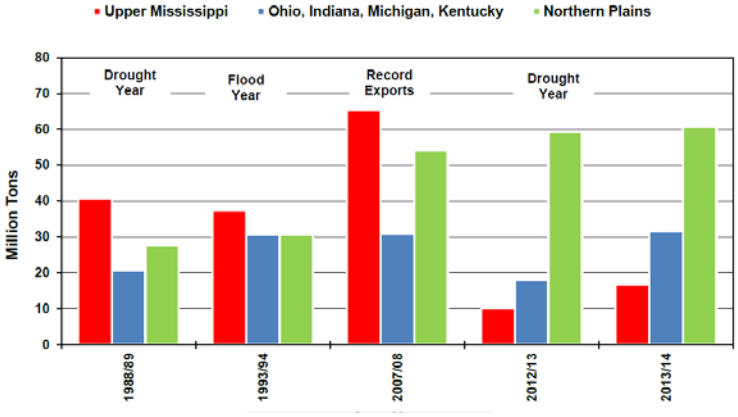
We're at 160 bushels an acre for corn at Informa today. We are at 43.9 bushels for soybeans. We see there is a +10 and a -10 that you could see on the other side of that yield, where things are developing in the way the weather is, although there is a bit of heat that is trying to emerge into the system. Nonetheless, we have a rebuilding of supplies coming.

Meanwhile, when you look at that investment, where is it going in an infrastructure for storage? It is going both to on-farm and off-farm and certainly those are moving it with very similar growth rates. On the off-farm side we've seen that within the area of renewable fuels and we've certainly seen that in some of the elevators across the country. Look at UniTrain and some of the export elevators, but they are moving in a very similar pattern.

With on-farm, you see very similar growth rates. When you are talking to farmers, many of them want to have enough capacity to hold all their harvest at one time. They feel that's a greater marketing opportunity for them and gives them greater investment options in that environment. Certainly when you fly or drive around and see that shiny metal that is quickly oxidizing, you can see a testimony to that in the market. They have been highly incented to do that.

Let's look at potential grain and soybean flows by surplus and deficit regions (Chart 7). This is very important in the United States. We think about, "Where are your surplus regions?" There are three key surplus regions in the United States: The Upper Mississippi in the red is Illinois and Iowa. Historically they do about 50 million tons of surplus a year and upwards to 60 million tons.

Chart 7
Grain and Soybean Net Shipment Position by Transport Region



You take a look at Ohio, Indiana, Michigan, and Kentucky (OIMK), that has been a very steady area at 30 million tons of surplus. Again, that is how much grain is available to ship out of the regional to go to those deficit areas.

Then you have the Northern Plains. That is from Wisconsin, all the way over to Montana, and down into South Dakota. That is your Northern Plains. That is your big growth area.

Look at the upper Mississippi River. At their peak record export year, you are looking at upwards of 65 million tons of surplus grain. Last year's drought and this year's current crop year, we're going to be about 10 million tons. Never before has the OIMK had more surplus grain than the Upper Mississippi. Certainly, the Upper Mississippi has been losing the surplus supplies because of the ethanol buildup. We've focused on Iowa, as I mentioned earlier, sucking in all that corn from different areas and becoming a deficit state in that regard. But that has a lot of implications, because the Upper Mississippi serviced the Mississippi River and the Illinois River heavily. We'll look in a moment how that has shifted dramatically.

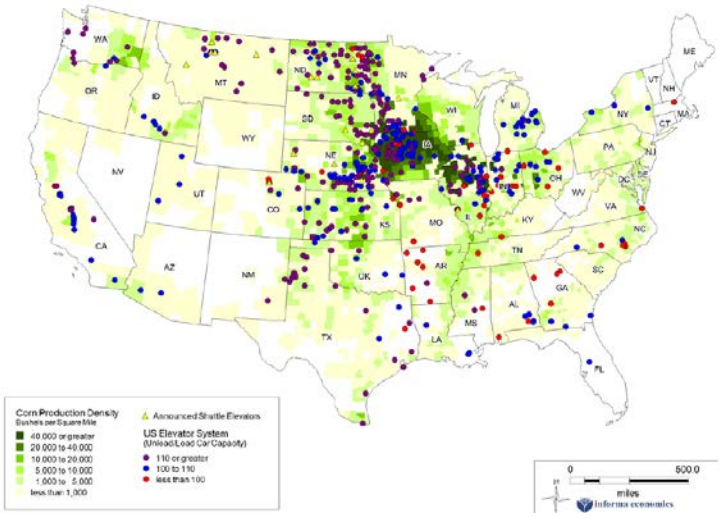
What if we do cap and the mandate holds – 15 billion gallons from corn – will we start seeing a surplus build up in some of these areas, especially from the corn side of things? Now it's a matter of looking at what the commodity mix is.

The Northern Plains continues to ramp up higher and higher. That is a testimony that we see with what is going on in the shuttle maps and the expansion of export elevator

capacity (P&W), where their capacity has increased some 30 percent over the last five years and we've increased export capacity in the United States by 10 percent over the last five years. There has been a lot of change in that regard, all because of different growing patterns.

Looking at Map 2, there are well over 525 shuttle train facilities in the country: highly efficient, high through put, quick turnarounds. It's just a constant circle either out to the Pacific Northwest, back in the Corn Belt, or down into the Texas Panhandle, out to the Southwest bean markets, and a little down into the Southeast area.

Map 2
Railroad Grain Shuttle Loaders



Not all rivers are created equal, not all railroads operate over the same territory. You have an eastern railroad/western railroad. But for the most part, it's about the western railroads and how much has been built up in those areas and bringing significant efficiencies. And there are still many that are being announced and many being studied to put more dots on that map.

Taking a look at the train size, Chart 8 is a testimony to that. If you look at the green line with the triangle, that is your unit train loading of all grain and soybeans. That has been increasing to where about a third of all carloadings are in unit train capabilities. That red line is all about wheat and those move a lot less in unit train-type environments, just because of all classes of wheat. If you break it down, it's all about soybeans, because so much is going to the export market.

Chart 8
Grain and Soybean Tonnage Moved by Train Size

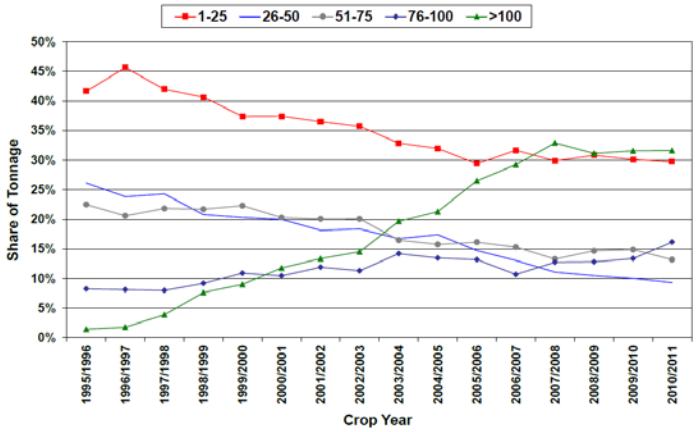
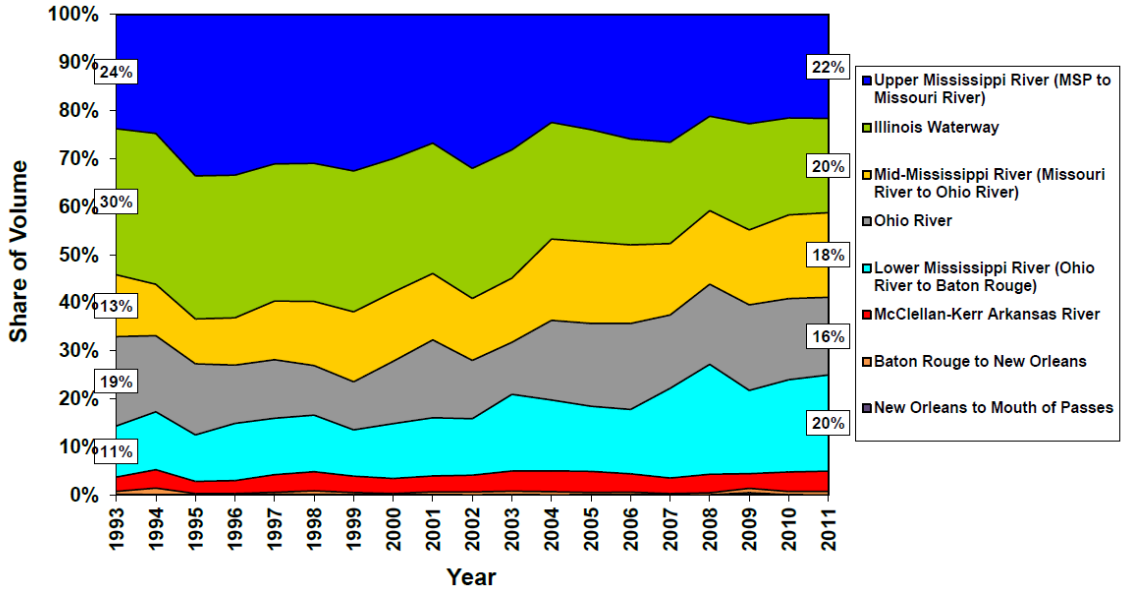


Chart 9 is the one about the Upper Mississippi River that is very important. If you look at this from 1993 to 2011, look at that blue area. That's from Minneapolis, Minnesota, all the way down to St. Louis to the Missouri River. If you look at that green area, the next area down, that is the Illinois River.

The next section down is the yellow one, that's the Mid-Mississippi – from St. Louis to Cairo, where there was a severe drought and shutdowns last winter. What you see historically is about 70 percent of grain moved by barge originated on those three stretches of the river. Today, you are looking at roughly 40 to 50 percent of the grain originating on that stretch. That is going to shift, as we've seen, through there, partly because of where surplus supplies are located. Most of that has been expanding in lower Ohio and then on the Lower Mississippi from Cairo all the way past Memphis down toward Baton Rouge. That is where you have seen so much investment.

Chart 9
Shift in Barge Loadings on Inland River System: North to South



We've had the opportunity to work with a brand new port that just opened here 30 days ago, putting together the master plan and we are helping serve in the interim as a port director at Port of Cates Landing. This is the first public port built on the inland river system in three decades. You had TIGER grants and you had local and state money to build this port. If you build it, will they come? That's the challenge to see things come together.

The Lower Mississippi is where a lot of commodity movement has taken place. This is just on the grain side. When we look at some other commodities, we see some very similar patterns.

Think about the locks and dams that have aged. You have less surplus supplies on the Upper Mississippi. How does this change for the future here? Not all barges are built equal. Barge assets are very different today than what we were building back in the 1980s. In the 1980s they were built for a 9 foot, 6 inch draft. Today, we are building equipment with about a 12 to 13 foot draft. To go through a lock and dam, it has to be 9 foot, 6 inches or less. So you are not going to fully load a modern-built barge to go through some of today's locks. Some days you get more water than others. The reality is the Army Corps of Engineers is going to give you 9 feet of water by law and that is what they are going to try to give you all day long.

On the Lower Mississippi from St. Louis all the way down to New Orleans there is open draft to fully maximize the loading of the biggest barge available today. We are seeing some of these shifts that have taken place. How will barge operators and carriers respond to take equipment up the Upper Mississippi, when there is higher cost and you need to charge higher premiums?

In terms of the ocean, the chart you have in your materials shows an 18,000 TEU vessel that Maersk delivered recently. They ordered about 20 of these 18,000 TEU (20-foot equivalent) ships. Just yesterday, she started loading containers for the first time and now she's sailing on to the next port to take on some more containers to get her up to 14,000 TEU. That was a wild moment!

Three days ago, there was an announcement that, yes, we can actually design vessels to go to 24,000 TEU. We are now in a whole other category. And it's all about reducing slot costs – the cost for that box to be loaded on that ship and move around the world. That's what we're seeing with these economies of scale. The reality is this: How many ports in the world are going to be able to service these big vessels? In the United States, the only ones we can service are in that 6,000 to 10,000 TEU range.

In my home port, the Port of Tacoma, just this last week they received their first 10,000 TEU vessel. She is now sailing on to another port. But those are about the maximum size we can receive in the United States. What we are going to see, however, with all those bigger ships coming into play, they are mainly servicing the Asia, the Mediterranean, and European trade lanes. We get a cascading effect of some of those other, younger generation vessels that could start calling on the United States.

Now the demand comes from the other side. You've got to improve your infrastructure to take these bigger ships to get lower cost.

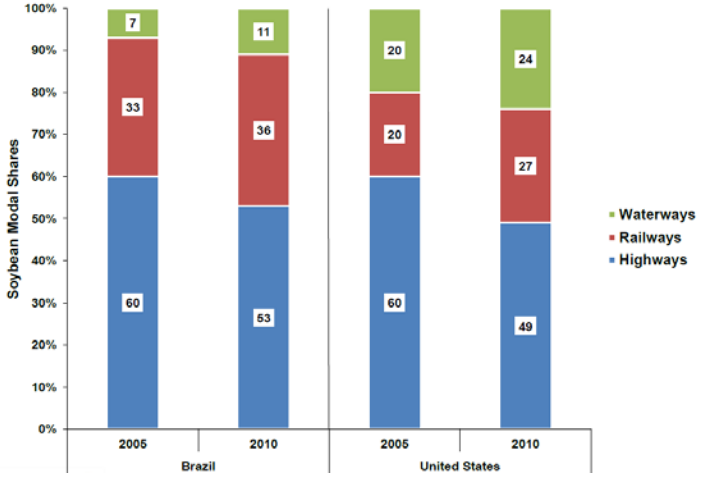
Where does it end? That is the conundrum we keep finding ourselves in. How do we stay competitive or when do we say enough is enough? I can tell you this, on a lot of the work that we've done with different groups and doing a lot of phone calling with engineers and highway groups and such, we just don't want to build any more infrastructure. We can't take care of the infrastructure we have today. Why do you want me to build a brand new bridge with a whole new road that goes to it? I have to maintain that now. So that's the conundrum we're facing. Where is that balance?

The balance is the market will dictate that, right? All day long, it's all about price and who will win out and move forward. In terms of loading those container ships, you are talking almost a 100 miles of containers stacked end to end. About 3 to 5 percent of our grain exports move in a container. That's roughly 100 to 150 million bushels. Where it's being loaded, two-thirds of it is coming out of Illinois, where you have all the unit train services, bringing all of our high-value goods and things we like to consume and those boxes are empty, taking back all these low-value agricultural commodities. But it's a nice backhaul. It gives opportunity and it's a balanced approach.

In some other areas of the country, you see some transloading taking place. Those are still very important. We're working with some folks on a container-on-barge operation. I've been pessimistic for a long time on container-on-barge. But now we are seeing some numbers that are working and people are saying this is an opportunity that looks like the numbers could work. To get unit train services to work to Elway or the Pacific Northwest did not happen overnight. Someone had to risk and try to build the program. What we're seeing is people being entrepreneurial, willing to risk a bit, and to find the rewards on the other side.

Talk about risk, talk about challenges – look at South America and their infrastructure influence. Chart 10 shows two time periods (2005 against 2010) for both Brazil and the United States, looking at moving soybeans to market position. The bottom line is this: South America is making better use of its different modes of transportation. It has been making investment someplace, because we looked at some of the numbers. They are sending more by rail, a little more by barge, and a little less by truck to market position.

Chart 10
Soybean Modal Shares in Brazil and United States



The reality is that still over half of their soybeans are moved by truck. The United States is not too dissimilar. In fact, because of the big soybean export push, we've been using the more efficient modes of transportation. There have been developments in Brazil. Here's the thing we see down there.

There have been a number of projects that have been announced in Brazil. We looked at a few of those to see if they were to materialize – and that's a big word "if" – and you start putting those all the way through to accommodate on different corridors, what can you realize in real efficiencies or gains? Some improvements could lead to $40 a metric ton reduction in transportation cost.

The most recent year we're in the middle of with a big export program and all the production of soybeans and corn, Brazil is going to have a record second corn crop this year, they are doing a lot of work to find as many truckers as they can. They have new trucking laws down there. They are at the highest point of their inland transportation costs. But, if we start getting back to some balance of who is going to be producing and moving commodities, their improvements in some sectors of their system could be a 20 to 30 percent improvement in cost. As we heard earlier, the farmers in Brazil are very low-cost producers, as compared with the United States.

Why is it so important for the U.S. farmer to have a good infrastructure system? Because the cost of production is so high here compared with other places in the world.

Let's improve the wait times at ports and start improving the flow through those areas. We could actually see a 50 percent savings and that's $55 to $60 a metric ton. Here's the point in this. That begins to put Brazil on par with the U.S. cost of transportation of moving grain and soybeans to market. That further bolsters their opportunities in South America.

Current year aside, we are still thinking about what could become. Here is the reality in Brazil. In Mato Grosso, they have a tax. They tax people who are moving bulk commodities, whether its grain or logs or different bulk commodities. They pay a certain tonnage tax. That money is supposed to go into an infrastructure pool.

Well, there are a couple of big events in Brazil. There is the World Cup and there is going to be the Olympics. Doggone it! They don't have infrastructure for it. They went looking and they found a big pot of money in Mato Grosso. They said, "Mato Grosso, thank you so much for being innovative and forward-looking. Thank you for helping us fund our infrastructure."

There is that big "IF" … if Brazil will invest in its infrastructure. Certainly, they are trying to privatize their ports and make some of that happen.

Last, let's look at sustainable transportation. We heard about sustainable farming in Ukraine and certainly U.S. farmers all contend they're sustainable in their approach, but let's see what it looks like when you put in modal factors.

In Brazil, on average, they produce about 20 percent less soybeans than the United States, but they both export about 60 percent of their soybeans to China and slightly varying volumes to markets around the world. In Brazil, the modal share is becoming comparable to the United States, as I just showed you. However, truck is the big difference. Everyone has already said under their breath, "Yeah, Ken. They're using less truck, but they are going 17 times further!"

They are going 667 miles, on average, moving their soybeans to market position. When you start factoring that through, Brazil is highly dependent on its truck, such that in Brazil alone trucks half the ton miles of moving soybeans to market position. They consume about three-quarters of the fuel moving to market position. Truck emits nearly 90 percent of all CO_2 moving soybeans to market position in Brazil and they represent about 71 percent of all fuel spills.

How does that compare with the United States? It's actually worse than it looks. Compared with the United States, Brazil consumes twice as much fuel, moving 20 percent less soybeans to market position. They are emitting four times as much CO_2 than we are in the United States and they are spilling nearly double the fuel in moving soybeans. These are ***stark*** differences, when you look at how sustainable the system is out there. That is a testimony to the producers and to the transportation providers and innovators here of using our infrastructure that's aging quickly, that needs major surgery, but it is a testimony to how we are as efficient as we can be in the United States of America.

The global age is readily apparent. The world is getting smaller. Certainly shipping options are expanding, but we are not as pivotal as we once were because, as we get more logistics options, you open up more opportunities for advantages and price capabilities. Certainly developing countries are slowly coming of age and they're doing it through expanding their infrastructure, albeit they've slowed down in the past few years. We've heard money is cheap; it's just not being expended. Port developments are everywhere, certainly in China and in South America. In Russia, we're seeing container lines wanting to put in better container service in those areas, but there is still a long way to go.

In all those different markets we look at moving commodities into, there is still a lot of work to be done. The economy drives infrastructure issues about how we fund it. There is much work to be done and try to go through the system.

I appreciate your patience and your time this afternoon. I look forward to being with you the rest of the afternoon.

General Discussion (Transcript)

Moderator: Jason Brown
Economist
Federal Reserve Bank of Kansas City

_____: Over the past decade, we've seen a tremendous amount of infrastructure developments across the globe. I just wanted your perspectives on what you think are some of the unique geographical locations that still need significant improvements in infrastructure to compete in global markets. Maybe there are endless possibilities to pick from, but if you had to narrow in on one or two, what would those be?

Kenneth Eriksen: I am going to answer it this way. When we think about the supply situation, you need a supply that needs to be moved before you can fulfill the demand in difference areas. When we did some work at the Panama Canal, they looked at the demand response. The demand is this, so the United States is going to provide x. We said, "Are you going to guarantee the United States is going to have a supply for a year?"

Within the United States, we started looking at where the supply is, and the composition of production against the composition of exports against the composition of uses – you have very different demand requirements then for the infrastructure that has to take place. That is still very true in other parts of the world. Certainly, we've heard over and over again, Brazil is one area that needs significant infrastructure improvement.

Defining the way to make it work today, certainly price is dictating that. If it was such a challenge and it couldn't be done, wouldn't the infrastructure have already been put in anyway?

So we start looking down in South America, yes, there is a great opportunity down there. But there are a lot of hurdles to overcome, whether it's political, cultural, geographic, etc. But where is the production going to take place here and see how that emerges.

We've worked with a group a few years ago in Bulgaria on a river loading terminal. They are finally putting up that facility. They are looking at how they are handling their infrastructure and looking at people improving the supply chain capabilities incrementally.

But it is always about that last mile or that next mile after that or the mile before that that has to be improved. So it's constant.

Some of the issues are constant wherever you are in the world – but certainly South America with their challenges and Brazil in particular. Then you get into Ukraine with some of the challenges on their highways and roads. But their ports have been very progressive in expanding some of the export capabilities and trying to take advantage of volumes that can go through there.

Russia, as well, is trying to emerge out of some of their challenges. They want to be self-sufficient. They want to be exporters of higher value commodities instead of being net importers of chicken or other commodities. So what does the full chain look like and how does that filter through the system? It's very unique from area to area. Those are very local challenges in some ways but they are very global. Some of the solutions are in this room with people who are already investing. The cost of production could change. That will necessitate improvements in infrastructure in different areas of the world.

Ryan Connors with Janney Montgomery: You mentioned many U.S. farmers would like to have on-farm capacity to store 100 percent of their harvest. Do you think that is a rational point of view? If not, what is the right number in your view? Do you really believe we'll see another round of on-farm storage investment if we end up with higher ending stocks this year, which I guess is increasingly the consensus?

Kenneth Eriksen: Good question. I made a comment that a lot of farmers we talked with said, "I want to have enough storage capacity to hold all of my harvest."

Certainly that farmer has had so much revenue and so much cash, he may be able to invest in on-farm storage and keep expanding it. What is the potential for yields? Farmers out west have gone from wheat to corn and they consider adding more capacity. It may be more cultural to want to keep adding. They have held on to wanting to store it and wanting to market it. They envision they can be better marketers of their grain by holding it and then selling it off at different periods.

Will that continue? It is hard to believe you can see an environment we're coming into where we are going to have 14 billion bushels of corn, we are going to have a 2 billion carryout next year. If we think about doing that again the year after and consider the $4 or $5 range on corn, how much longer do you keep reinvesting in some of that infrastructure

on-farm? Now that has a lot of implications. Who are the manufacturers of that equipment that goes into the on-farm areas? Who makes all the components that have been going into those facilities? So those are some of the challenges.

We could certainly see a slowdown. I would anticipate that. If we get these capacity utilizations this year, you've been running about 95 percent capacity utilization on storage capacity. In some areas, you are obviously well over that, because you are putting a lot on the ground and you draw it down, as you go forward. But it is also the speed of production. Some of these farmers think, "This is an opportunity for me to not have to hire as many trucks. I can make shorter turns and put them all in one spot and take advantage of some of those logistics issues."

Those are some things we've seen in different areas that have better aeration and better conditions to grow the crops.

Down in the Delta, where we are, you see center pivots whenever we drive between Memphis and Tiptonville, where that Port of Cates Landing is located. You drive all the way down to Jacksonville, Georgia or Mobile and drive that arc and even in central and southern Illinois, there are central pivots going up all over the map up there. You talk to the local bankers and those are being paid off within the same year. That's certainly been very lucrative for those bankers. They say, "That's been the only thing that's being funded anymore."

So they are very happy to see that. From that, you need the infrastructure to support, because you are not going to grow cotton in the Delta. The other day we jokingly said, "If everyone stopped growing cotton for a year, no one would notice. We have so many cotton stocks in the world."

But, in the Delta, you've seen that shift to more corn. If you are putting up a center pivot, you will keep running it. So what does it mean to bring in that infrastructure and go to market? Part of it is they think they can be better marketers of that grain.

We looked at relaxing utilizations in some cases, if we get this current buildout complete. That could be the challenge. The reality is we get the price. What does that do? The farmer may balk at that and hold off.

Industry Panel (Remarks)

Paul Hammes
Vice President
Union Pacific

Good afternoon. That was a great presentation by Ken. In fact, it was so good I don't know if I have anything to tell you. In my presentation, there will be a lot of repetition. I'll just hit on a couple of the key issues and then maybe I will try to focus a little bit more on overall investment trends in the rail side of the U.S. transportation sector. I don't have that on the slides, but I will try to walk through that with you.

The core theme of my talk – Ken really did hit on most of these –was that we have a good transportation infrastructure in the United States. We've taken a lot of cost out of it and we've become very efficient and productive. We are not investing the way we need to keep up with what our own demands are going to be through increased exports as well as domestic shipments and then competing with the rest of the world.

Chart 1 is to give you a little more perspective about how the three primary modes of transportation in the United States look relative to each other. They are 2007 data, and I apologize for that, but the Bureau of Transportation statistics updates these about every five years. They last did it in 2007 and the 2012 updates are going to be due later this year. So there really is lag or a lapse between studies. Some of the data I had was 2010, but for comparative purposes I used 2007.

Chart 1
U.S. Transportation Capabilities

("other" excluded)	Rail	Water	Truck	Total
Total Tons (2007) *(thousands)*	2,082,720 16%	781,020 6%	8,721,390 67%	13,017,000
Ag Tons (2007) *(thousands)*	384,200 19%	228,000 11%	1,379,000 69%	1,991,200
Ag Share of Total Tons	18%	29%	16%	
Total Ton Miles(2007) *(millions)*	1,549,557 46%	331,506 10%	1,351,531 40%	3,344,663
Ag Share of Total Ton Miles	22%	44%	28%	
2010 System Miles	138,518	12,612	150,309	
1 ton = MPG	413	576	110	

Source: Bureau of Transportation Statistics

If you look at how it's split in terms of total tons, you can see that rail makes up about 16 percent in the United States; 6 percent, water; and 67 percent, truck. Agriculture on its own is about 19 percent, rail; 11 percent, water; and 69 percent, truck. You really need to look at ton miles when looking at this, though, because there is quite a bit of difference from that perspective. If you look at total ton miles, then rail becomes 46 percent of the shipments; water, 10 percent; and truck, 40 percent. Under Ag Share of those total tons the way it is split out, it becomes 22 percent, rail; 44 percent, water; and 28 percent, truck.

To put it into perspective in terms of size of the systems we have in the United States to support and to maintain, rail is about 138,000 miles of track – that is the Class One railroads, as well as the primary Class Twos for short lines. Water is just over 12,000 miles. That is the inland waterways system, including the Intracoastal canal.

For truck, there are different numbers out there. This is the interstate highway system and the major highways total somewhere between 150,000 to 165,000 miles.

Rail and truck systems are comparable in size. Ken mentioned the efficiency or sustainability of some of these other modes. Rail moves one ton 413 miles on a gallon of fuel; water, 576 miles; and truck, 110 miles.

I am not going to go through the capacity, because Ken touched on it, but, with growing U.S. and world populations, we all know we need to move more as we go forward. Infrastructure spending is not aligned with these projected growth rates and the cost of new capacity in addition to abatements is substantial. Since Ken covered many of these points, I won't get into it.

Some of the real hurdles are the funding and aligning the funding in the policy. Where the disconnect is, as Ken pointed out, is that much of this has to go through Congress in terms of setting priorities, as well as funding.

That has really led to a lot of stalemates on the water side of it and the truck side too, because the priorities are not clear on a national transportation policy. There are conflicting objectives out there on the water side. You have navigation, water quality, recreation, and a lot of different rules.

The size or impact of the Missouri River is substantial. And we saw two years ago, when the Corps of Engineers held back a lot of water to protect the recreational interests, we had unexpected snow and we had tremendous flooding through the Midwest, which

caused a lot of difficulty. Last year the book said to let more of it go. Then we started running into low-water issues. So it's balancing that out. There is really not a clear policy out there.

On the truck side, you have issues between truck and passenger and clearly funding. Secretary Fox did outline his three major objectives. He was just appointed Secretary of Transportation. Safety, of course, being number one; then environmental; productivity and efficiency – how do we utilize our roads better and more efficiently; and finally he addressed funding.

It's a great goal for the Department of Transportation and the Secretary, but his ability to change that is probably going to be just from a leadership role in trying to assign priorities and trying to work with the various constituencies. Trying to provide enough direction to get Congress to pass legislation and help define policy is going to be very difficult.

That is going to be an uphill battle for the United States in terms of transportation and, in turn, agriculture. Agriculture isn't driving the transportation needs and policy. We're a big contributor, a big user, of that transportation capacity. But, as you saw on some of those statistics, we're just one piece in a big puzzle. It's going to take something more than that and it is going to take a real broad-based constituency to really create some change there.

You have the drive for better transit systems, whether that is passenger, rail, subways, or whatever. Trying to balance that with the longer haul moves and freight transportation will present some problems as well.

Let me talk a little bit about the U.S. rail infrastructure and investment there. The rail industry – the Class One railroads – over the last 10 years has invested about $110 billion in capital. That is a substantial increase over the previous 10 years.

One of the biggest changes, of course, that prompted that are the incentives or signals the market gives our industry, since we are funding our capital and infrastructure almost exclusively privately. There are some private-public projects going on and with the TIGER grants there has been more public money coming into the system. Overall, it's primarily a privately funded industry. What we have seen since 2002 is an increase in rates,

which has brought up the concern of shippers that rail transportation became more expensive.

Of course, the trend prior to that was very flat rates, in fact declining rates on a real basis, and no returns in the rail industry. Consequently, no investment occurred in the rail industry. That changed at the beginning of 2002. Rates began to go up, because we didn't have enough capacity to handle what the customers wanted us to move out there. That prompted higher rates, which started rationing out some of the supply we had and also increasing returns.

The one thing the rail industry did, and it is also earning some credibility – both with our customers as well as the people in Washington, DC – is the rail industry has put that money back into the railroad. The rail industry is investing 17 to 18 percent of revenue back into capital and reinvesting in the railroad.

If you look at any other industry, it is not even close. If you think of any business you're in, and if you're taking 17 percent of your revenue and putting it back into capital, it's a huge number. But that is what it takes. At Union Pacific, we're putting back $3.6 billion in 2013. Last year, we put back $3.4 billion.

Where does that money go? About half of it goes to just maintaining the railroad as it is today. We have 30,000 miles of railroad. We roughly replace three miles of rail a day and 10,000 ties. Over 30 years, you get your railroad rebuilt, but that is a long time and that's a lot of railroad. So half of what we spend is just for maintenance.

The rest of it goes toward capacity and equipment. When we look at capacity, it is not laying down new pieces of railroad throughout the country. It does involve some new rail with double-tracking, where we have bottlenecks. What we're really doing is spending money to put capacity into current network and make it more efficient.

We'll take pieces of the railroad where we have more volume. We will add longer sidings. We'll put signaling in, so we can run those trains faster and closer together. We buy new locomotives that are more efficient and are going to meet future environmental requirements. We add what we call commercial facilities, where we can help build capacity to support businesses that are going to come to the railroad.

As we look at where some of that has been occurring, we spent a lot of money in 2004-07 on what we call the Red X, because it runs through Wyoming, Nebraska, Iowa, and

into Kansas and Missouri. That was to support what appeared to be a very strong coal business, a business we thought we needed to add capacity for. That started changing in 2009, with the economy starting down, lower usage of electricity, and also some mounting environmental costs to maintain running of these coal plants. So, we went from running 35 trains, and even higher, out of the Powder River Basin every day to today running 28 or 29 trains and being as low as 22 or 23 trains at the bottom of the recession that hit us. Now we have excess capacity there.

As a railroad, we have to think long term. The investment decision we make is for a long time. It's beyond 30 years and it takes a long lead time of planning, spending capital, engineering, permitting, and so forth. Two, three, four, or more years lead time is required for spending. We have to be fairly nimble.

What we've done with the shift – it's been a real plus for the rail industry – the coal has gone down and we've seen the crude oil pick up out of the Bakken and out of the southwestern United States. It's meant that we've had to spend a lot of money to upgrade and increase the capacity in our southern quarter.

All of a sudden we're moving 140 trains of oil every month from the Bakken -- not directly, we interchange with the BN and CP to do that because we didn't have the capacity. So we're coming from behind there. We're tight there. We have excess capacity through the central quarter. What we've done, and we've been fairly nimble, we've redirected our capital into that area. As you see these shifts as an industry, given those signals, we can respond, move that capital around, and adjust our capacity.

Another area where we've spent a fair amount of money as an industry, as well as Union Pacific, is on the intermodal side. Not only are the imports coming back, and of course we hit a real peak back in 2008 and that has dropped off, the domestic intermodal side has really continued to grow as we do take more trucks off the road and put them on the rail.

We've invested in that to take those choke points out, so we can run those trains fast and reliably, so you can compete with that truck. That's the only way you can do it. Once that customer loses their confidence in your ability to be their supply chain, they'll walk away from you pretty quickly. The first thing you have to do is supply that service. The U.S.

carriers have done that, which you can see in terms of our velocity and our dwell time. All those types of measurements have drastically improved.

Another area to support that intermodal industry is to build ramps in capacity to take that volume, put it into a container yard, get it on a train, get out of that terminal as quickly as possible, and then move that train forward. We've seen a lot of development in intermodal terminals. We're building one in Santa Teresa, New Mexico, east of El Paso. That is going to be a $400 million project. BN has a large project going on in Kansas City. There are other projects going on in the east. Norfolk Southern has their Crescent Corridor, all to support this kind of business. That's where the investment has been going.

I can tell you from UP, in terms of agriculture, we're staying abreast of it. But we certainly have railcars parked, so we have capacity. We have locomotives and crews to handle it as well.

If you look at the western carriers, BN has invested substantially in the agricultural sector. You've seen tremendous growth in shuttle facilities on the BN. We've seen a number on the UP. So our customers are expanding and getting ready for this growth in agriculture, particularly going to the west in the Pacific Northwest. The railroads are responding to that as well, but not to the degree we've seen any investment to support some of these other sectors immediately.

It's like the overall view, as the agricultural industry goes, we're important pieces to the transportation puzzle, but we're not driving it right now. So some of these investments taking place in our southern quarter, for example, certainly are going to improve our ability to support export moves out of the Gulf, out of Kansas, Nebraska, and so forth, for the soybeans moving down there and the wheat out of Kansas. We piggyback on that.

The same thing is happening with the central quarter, where we did invest a lot for not only coal, but other parts of our business too. We were able to take advantage of that, as we move grain west, not only the Pacific Northwest, but domestic markets in California, Idaho, and the Southwest.

In a nutshell, the rail industry has received the right incentives from the market. They responded responsibly in taking those returns, putting them back into capital and capacity on the railroad, and hardening the infrastructure to make it more reliable and provide better service for the customer, which in turn just makes us more efficient and more

competitive. It was also mentioned that a lot of export capacity has been built up in the Pacific Northwest. I think the rail industry has responded there as well to get ourselves into position for that.

Beyond that, I can't really add too much more than what Ken presented in the overall. Hopefully, that gives you a little better piece of the rail sector.

Industry Panel (Remarks)

Chris Erickson
Managing Director
High Quest Partners

Good afternoon. Thank you again for inviting me back this year. I was very lucky to have the opportunity to review Ken and Paul's presentations, so I'm trying to minimize the overlap and try to put a different spin on this from an institutional investor perspective in regard to private capital coming into agriculture today.

Last year, I focused on farmland. This year, I want to focus a little bit more on what I would call midstream storage and similar items on a global basis.

Something my firm does is we host a series of meetings globally. The speaker earlier today – Joe Bond – has spoken at several of our conferences around the world on institutional investment in agriculture. We also do New York, Abu Dhabi, Singapore, and London four times a year. Again, the notion of that event is really to make you sit back and educate institutional capital on agriculture. As you have heard from a variety of people earlier today, the learning curve for these types of groups is tremendous. Bill Mott was talking about it earlier. The learning curve for these guys, especially when you are looking at money managers coming out of New York, London, Singapore, and places like that, they are pretty far removed from the farm. Some of them have ties back; they grew up on farms. But the majority of people are a couple of generations removed from the farm. So agricultural economics is not something they necessarily understand.

Quickly, in the first couple pages all I really wanted to show was that you have increased production coming. You have increased trade balances, where particularly emerging markets, China, are seeing increases in imports – both in soybeans, corn (again you see China and other locations growing), and wheat to a lesser extent.

One of the big reasons we are also talking about this today and we're asking why this is happening is not just because of increased demand in these countries and rising GDP, as we've heard that drumbeat over the past couple years in emerging markets. Let's also not forget that you're having what I will call professionalization of these types of farms such as

poultry and hog farms in places like China. You are going from what were traditionally cottage-level farms –animals fed from table scraps in backyards – to where you are starting to get groups that are using true feedgrains.

It is not just the increase in meat consumption, but it's the professionalization of the farms over there – whether it is hog, poultry, or dairy. As Bill was talking about earlier, you are seeing a tremendous increase and we received the same inquiries on alfalfa exports out of California to China. It's a steady drumbeat of what we're hearing. I just wanted to point that out. This is what investors are starting to pick up on.

We started working with institutional capital back in 2008. We started hosting these series of conferences in 2009. The education level is still very wide-ranging. You have some groups that made very large allocations in the billions of dollars. You have some groups that are kicking the tires to see if this is something they want to focus on right now.

Ken did a very good analysis in showing U.S. storage capacity roughly at about 120 percent of production. This is where I want to throw in the South American perspective. This is pretty analogous to Eastern Europe, too.

When you are looking at Brazilian storage and transportation loss, there is an article on www.agweb.com, by Dr. Peter Goldsmith out of the University of Illinois. He works with the ADM Institute for the Prevention of Postharvest Loss at the University of Illinois. Pete works with us on a regular basis, so I spoke with him a few weeks ago about this. The numbers they are looking at right now – this is Mato Grosso right here – their postharvest losses are about 10 percent. In the state of Mato Grosso, you are looking at 34 percent undercapacity for storage.

They did a regional analysis in one of the regions in Mato Grosso with 6.9 million metric tons undercapacity, assuming a full double crop, which wouldn't happen. That is equivalent to 5,420 bushel storage bins, just in this one region of Mato Grosso. This is where, when you are looking at this from a return perspective for institutional capital – whether it is endowments, pension funds, money managers, private family offices, and groups like that – each of these groups is looking at agriculture in very different ways.

I can't remember if it was Joe or Bill who was talking about pension funds. You were looking for 5 to 8 percent returns. A lot of times they will discount the appreciation of the farmland, because they will want to build their models off of what cash returns will be on

a year-on-year basis. Anything they can get on appreciation is gravy, but they don't want to factor that into their models.

In looking at this, it is the pension plans and insurance companies that are having these much longer term outlooks of 15 to 20 years. When you start getting into private equity, they look at the 5- to 7-year outlook where they can get the higher-based returns that they take back to their institutional clients. The same thing applies to endowments, too. Endowments are looking at a lot of these different opportunities to maximize their returns, storage in particular. We did an analysis for a group a few years ago, where we were looking at an integrated farm-operating company, just by looking at storage and the nodes they were operating in Mato Grosso. If they added on-farm storage and held the grain four or five months, on average trends of basis you were looking at somewhere between a 19 to 30 percent increase in farmgate receipts, just by holding that on-farm.

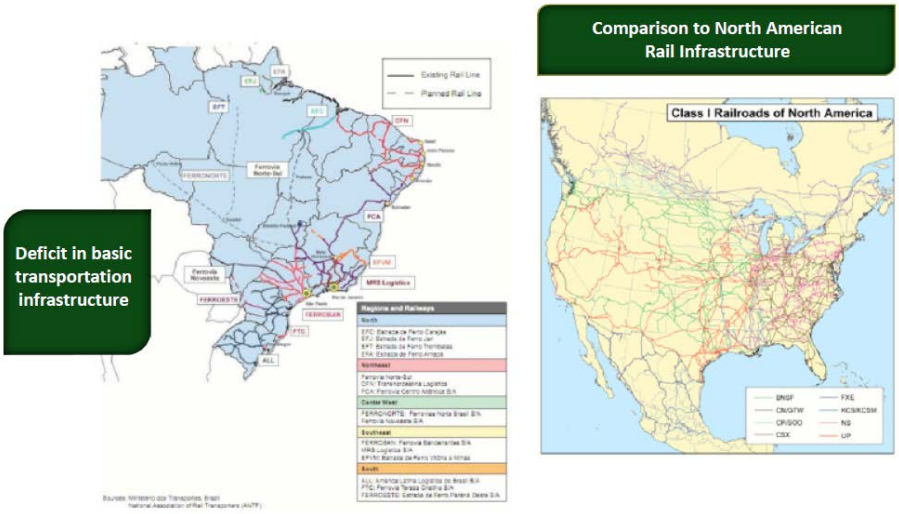
The buildouts occurred here in the United States, but it is these regions, as Joe was talking about, in Russia and Ukraine and South America where people were really beginning to say, "This is where we want to take a look at adding this type of capacity and how can we get access to it?"

Lastly here, transportation loss was 3 percent due to the poor condition of the trucks and roads in emerging markets. We've all heard – and Ken talked about that – in regard to the additional mileage, these guys have to contend with the poor conditions of the roads in South America as well as in Eastern Europe.

Some of the initiatives that are going on today, in addition to private capital coming in, is what the Brazilian government announced about two or three months ago. The state food organization is to receive $250 million for construction of new grain storage; co-ops and private companies are to have access to $12½ billion in low-interest, 15-year loans. The goal is to increase storage capacity by 65 million tons in the next five years. A lot of these groups are beginning to look at this and the government initiatives, as well, trying to spur this type of investment.

Map 1 is a quick example, taking a look at Brazilian infrastructure and mapping the railroads in the United States compared with South America right now. There is a pretty stark difference between the two.

Map 1
Brazilian and United States Infrastructure

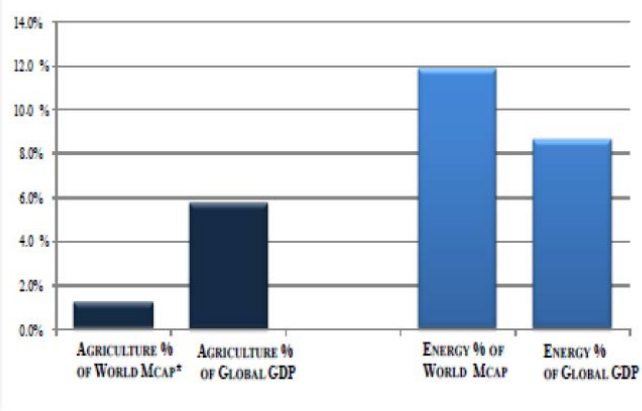


Lastly, as you've had this development in the central west for farmland in Mato Grosso as well as starting to push up toward Bahia and areas like that, you begin looking at the port developments that have begun happening in the northern part of Brazil. Manaus is here, where you are getting Panamax vessels moving 800 miles inland.

This is where you are starting to see the flows beginning to move and where they are trying to build the investment to do that. Again, this is a mix of private capital and a mix of capital coming from Bunge, ADM, Cargill, and other groups that haven't necessarily been players in the past. Groups like Marubeni, which bought a facility in San Francisco to Seoul. Other organizations like that that are beginning to invest in other global players outside the traditional ABCs that have done this. You are beginning to see an influx of other organizations and other trading companies that are wanting to get more involved and not just to be passive buyers in their countries, but beginning to actually get origination assets from a corporate level.

Private equity is beginning to look at this space, too. I have a couple of examples of this. First, Chart 1 is interesting on the basis of the investment sector, looking at global market caps of agriculture versus energy. On the agriculture side, agriculture accounts for roughly 6 percent of global GDP. When looking at the market cap of the companies that are probably traded, it is about 1 percent of the global market cap for agriculture companies.

Chart 1
Agriculture Representation in Global Equity Markets



*World Mcap is the sum of the market cap of all securities trading on Global exchanges (Data as of June 2011)

Source Central Intelligence Agency, Institute for energy Research

Contrast that to energy. Energy accounts for roughly 8 percent of global GDP, but they are accounting for 12 percent of the market cap. The market is valuing the energy companies much differently than agriculture companies. This is a very diverse group, not just ADM, Bunge, and those types of guys. This is the entire aspect.

An example I could point out today, you have a group called the Adecoagro based out of South America. It's an integrated farming operation. They are doing sugarcane and ethanol facilities as well. I believe they are the largest rice exporter out of South America. Today they trade roughly at 60 percent NAV. Granted, it's Argentina and Brazil. You've had a big drop in the stock price over the last couple weeks, obviously with different SUs happening in South America. The underlying assets are still trading at 60 percent NAV.

The market has a hard time of appreciating what agriculture is and to actually value a lot of the things we're seeing from institutional capital, because they don't have a strong enough feeling for ag and food processing.

The last thing I am going to show is a selection of mid-stream acquisitions we've seen. This is all public here. Many other ones that aren't public are known in the industry, but I wanted to put up the ones that are publicly acknowledged in newspapers, companies that have done investments in agriculture and are continuing to do it.

Table 1
Selection of Ag Mid-Stream Acquisitions

- **Temasek – 20% stake in Indian Firm, Godrej (Agrimoney)**
- **GIC – 5% stake in Bunge (Financial Times)**
- **TPG – Inghams Australian Poultry (Sydney Morning Herald)**
- **Pritzker – Acquisition of Intersystems (Crains)**
- **Blackstone – 12.5% of International Tractors (India) (The Hindu)**
- **Centerbridge Partners – Acquisition and Sale of GSI (WSJ)**
- **Paine & Partners – Acquisition of EuroDrip (PEWire)**
- **China Investment Corp – 15% of Noble Resources (Bloomberg)**
- **Carlyle – Investment in Africa (ETG) – (WSJ)**
- **Private Equity – Acquisition and Sale of Gavilon (Bloomberg)**

Temasek is a Singapore-based, quasi-sovereign wealth fund, more of a stand-on private equity fund. They took a 20 percent stake in the Indian agribusiness aspect of Goodrich. GIC, which is the Government Investment Corporation of Singapore, disclosed last year they have roughly a 5 percent stake in Bunge. TPG, that is a Pacific Group, an Australian poultry group; Pritzker Group, which is the family office of one of the Hyatt heirs, acquisition of Intersystems Grain handling grain out of Omaha, earlier this year; Blackstone, a 12½ percent stake in International Tractors in India; Centerbridge Partners did the acquisition and sale of JSI, where they sold JSA to Adco a few years ago. Pan Am Partners acquisition of Eurodrip, the largest European irrigation company; China Investment Corp. did a 15 percent stake in Noble Resources; Carlyle spearheaded their first investment in Africa with ETG, which is one of the largest African trading companies primarily focused on East Africa. Finally, a coalition of private equity groups did an acquisition and sale of Gavilon. They acquired the old ConAgra Group, through a series of investments and transformed what was a relatively small group into the third largest storage capacity company in North America from 2008 to 2012 and haven't closed – but are pretty near closed – on selling the agricultural assets to Marubeni.

The interest is global. You see a variety of things from Australia to South America to Africa. The money flows are going to a variety of different places. A lot of it is dependent upon the risk tolerance of the groups going out there and what they are looking for. Whether it is sovereign wealth funds looking for strategic food security reasons; or whether it is pension funds; whether it is endowments; or whether it is private family offices, the risk return threshold is different for each one.

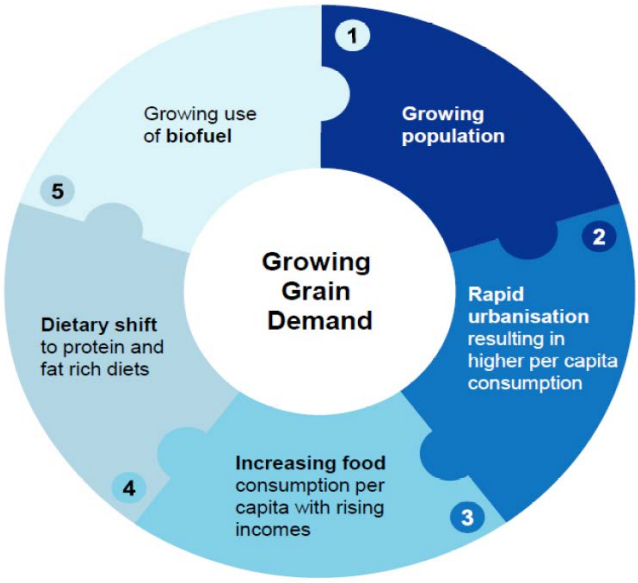
Industry Panel (Remarks)

Timothy Gallagher
Executive Vice president
Bunge North America

Thanks and thanks to the Federal Reserve for hosting this very forward-looking event. It is much appreciated.

There are a number of things that we've touched on earlier today, so I really won't run through all the items that are driving the growth in global trade. The one thing I will point out on Chart 1 is the growing use of biofuels. That is probably one thing that is in a transition phase. Certainly, the United States went up a steep portion of the curve and now we are on a flatter portion of the curve. The other thing we see there in Europe feels like the wave has gone out to sea there, not necessarily coming into shore. Maybe that is a word of caution we may need to watch in the future.

Chart 1
Trends Driving Global Trade Expansion

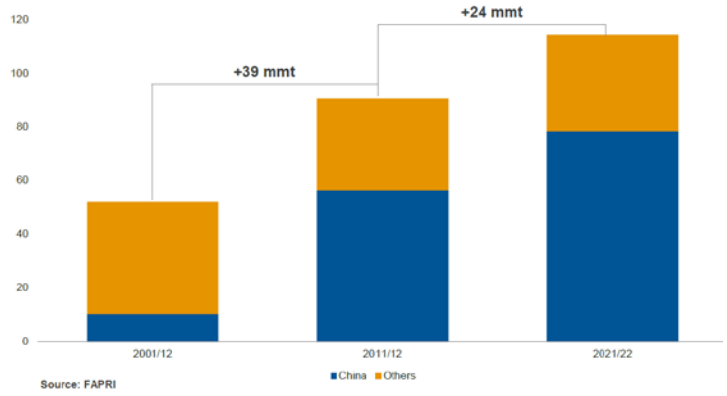


The next few slides I will run through quickly to tell you the what and the where: What's driving this, what has been driving it, and what do we expect to drive it going forward? These numbers are from FAPRI. Our company produces numbers that are very

similar. People make projections on these. I think FAPRI is a pretty good indication of how the world sees it.

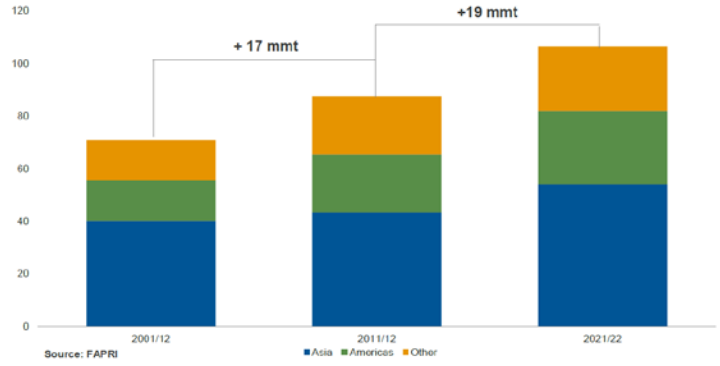
On the soybean side, you can clearly see China has been the global driver (Chart 2). They have gone from importing 10 million tons of soybeans ten years ago to 60 million tons today. And we have expectations that will go to 80 million tons over the next ten years. It's a big driver, but 24 million more tons of trade to take place over the course of the next ten years.

Chart 2
Soybean Imports



On the corn side, that growth is more balanced in terms of where it is going, probably more driven by the Americas (Chart 3). Again, as you look forward, we forecast pretty similar growth to what we've seen over the course of the last ten years.

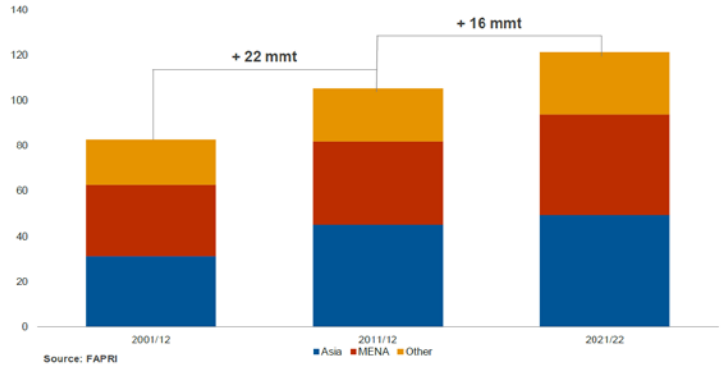
Chart 3
Corn Imports



Wheat is very much the same (Chart 4). The difference here is the demand driver on wheat becomes what I call the MENA region – the Middle East and North Africa – and

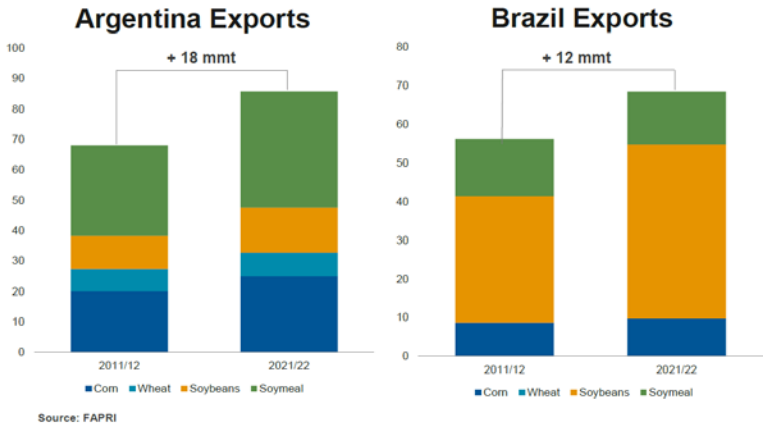
secondarily Asia. There will probably be less growth on a forward-looking basis on the wheat side. That's the shift to protein from a better diet.

Chart 4
Wheat Imports



Where does this stuff come from? The Southern Hemisphere clearly has an advantage from a soy perspective, and we would expect them to capture more of the growth from soy (Chart 5). The left side is Argentine exports over the course of the next ten years. We forecast an 18-million ton increase in Argentine exports. On the right side are Brazilian exports of 12-million tons. Some people are more bullish on that. What is driving Brazilian exports is the Chinese pull of soybeans.

Chart 5



On the Argentine side it is really more of a conversion, where they have converted soybeans to soymeal. They are the leading trade party of soymeal, which is driven by a differential export tax that encourages them to process the soybeans rather than ship whole

beans. They process the soybeans at home and ship meal and oil rather than shipping the soybeans.

From a Black Sea perspective, about 7 million metric tons of growth – and its one of these markets that has a natural flow to the MENA region, which is the growth driver on the wheat trade (Chart 7).

Chart 7
Black Sea Exports

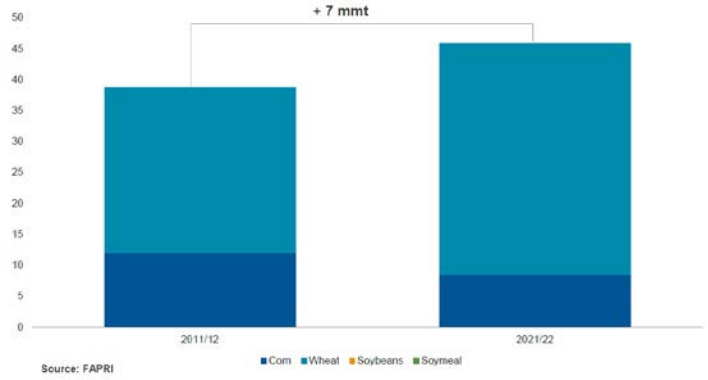
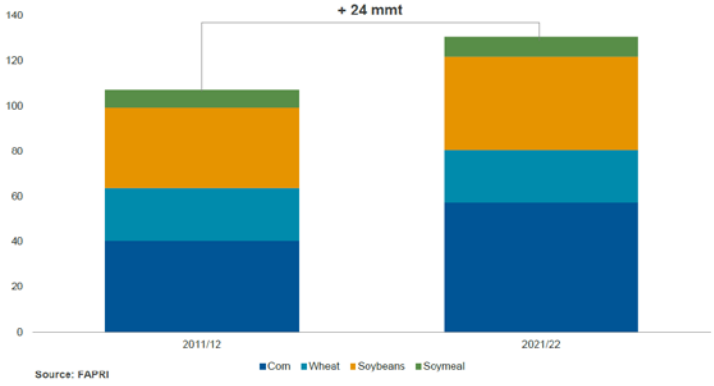


Chart 8 shows U.S. exports. You can see from a corn-trade perspective, our and FAPRI's forecast are very similar to what Bunge might show. It shows that we get back on pace with corn. We lost a lot of corn exports this year. The world went elsewhere. It went to the Black Sea. It went to Argentina. It primarily went to Brazil. We think in time, when we get out of this drought year, the U.S. market will buy back our share and that will be a big driver. But we will also still continue to export soybeans.

Chart 8
U.S. Exports

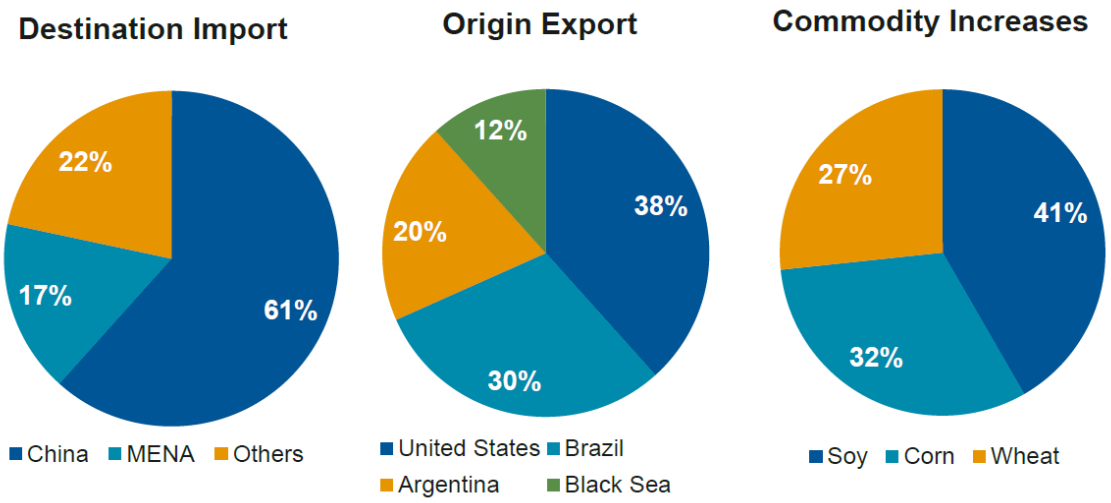


Going back five or six years, the notion was that Brazil would export all the soybeans to China. In reality, U.S. exports of soybeans expanded quite a bit through that period. The

thing that everybody probably missed was the amount of increase from 10 million to 60 million tons that China required.

These charts are just a little bit of a summary of those numbers in China, MENA, and others (Chart 9). China is the clear driver, in terms of export demand. We expect that to continue. MENA is also a pretty strong driver in that respect. Where it comes from really gets somewhat split between the United States, Brazil, and Argentina, and the Black Sea. The Black Sea may have a smaller share, but still is a formidable competitor. It is fairly balanced, but it does change by commodities. You see the soy side, which is protein-driven, that has the largest share increase we see out there.

Chart 9



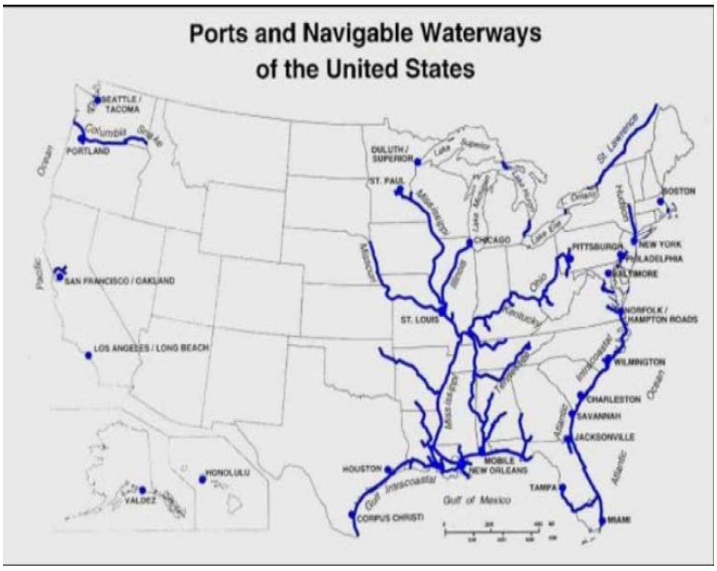
In terms of what we are here to talk about, those are some of the drivers behind it. That is a 60-million ton increase over the next ten years. That will require a lot of infrastructure.

If you took the rear-view mirror and looked back at corn, soy, and wheat, we had about an 80-million ton increase over the last ten years. It is certainly not out of the question, even with a reduction from a biofuels consumption perspective.

We've touched on this – Ken hit it very nicely – the United States is in very good position with wonderful natural resources. Map 1 shows that. The Mississippi River and its tributaries, the Upper Mississippi, the Illinois, and the Ohio serve as a massive funnel to feed grain out of the base Cornbelt, down to the tip of the funnel, which is in the New Orleans

area. New Orleans is a 65-million metric ton a year port, clearly the largest port globally anywhere.

Map 1



Source: AOPOA

If you want to understand the importance of New Orleans relative to U.S. agriculture, go back to the Katrina year. Not only was Katrina devastating to the people in the New Orleans area, but it was also devastating to the farm community relative to what it did to transportation costs. In effect, you have this big – I might describe it as a showerhead with all sorts of spray coming out of it and one of them is very large. That represents the Mississippi River and New Orleans port.

You plug that up, what happens? You build up pressure behind. You put a lot of pressure on all the other ports. That is exactly what we saw that year. The market got a sense of what that system means to us, that's why it is so important we do some of these infrastructure changes we've talked about. That is why the government has to find a way to fund these. It is not going to become any easier in the future, especially in the type of budget situation we are in today.

Map 2 is interesting. You can see what a vast network of railways the United States has – 300 kilometers of track. That is 190,000 miles of track. I'll show you a comparison in Brazil in a second and you'll look at that and shake your head. That's hugely important to

U.S. agriculture. It is the primary carrier off the PNW, a major supplier to the Texas Gulf and a strong supplier to the Center Gulf and off the East Coast as well.

Map 2

Ken has touched on this side quite a bit. It's probably the biggest concern we have from an infrastructure perspective, because it is the area where it's not clear how it's going to be solved.

Bunge recently built a new export facility at Longview, Washington – the first export facility built in the United States in 30 years. It is well in excess of a $200 million investment. Why did we build it? We built it for the reasons we talked about earlier. 1) We didn't have a presence there. 2) We expected strong growth out of Asia. 3) We expect strong movement off the West Coast. 4) The railroads have become much more efficient, so the PNW has many advantages to serve those destination markets. That is why we made the investment.

We are not the only one that invested there. We may have been the first one to build a new facility, but virtually all the other players on the West Coast made investments. This facility is really built to handle 8 million tons a year. The market in general off the West Coast added an additional 8 million tons a year. Effectively, the market added 16 million

tons a year. In addition, there have been investments in port infrastructure in the Center Gulf.

Louis Dreyfus has upgraded the Baton Rouge port. There are incremental investments in the Center Gulf. All told, in the United States, there has been about $500 million of investment over the last couple years or that will finalize in the next couple years. That's all in response to the expectations – the growth we've had in the last ten years and the expectations of continuation of that in the future. From a private-industry perspective, which is really driving port terminal, the investments happened to position the industry to be able to handle commodities in the future.

Think back to that U.S. rail map. Look at the concentration, or the lack thereof, of infrastructure within Brazil, especially the rail concentration (Map 3). It is almost unimaginable. Brazil is actually not that much different in terms of land mass than the United States. Looking here, you see the lack of rail infrastructure to serve these ports. I've been to Brazil a number of times over the years and it is astonishing when you see it.

Map 3
Brazilian Infrastructure

The next one is a little bit of what they have. You almost have to chuckle, but this is not an unusual circumstance. This is an actual picture from last fall's harvest, where a big storm washed out beneath the rail track. It took a while to get this repaired. This is a track that goes from the center of Mato Grosso to Santos, one of the most important flows out of Brazil. It is not an unusual picture. It seems there is something like this year-in and year-out

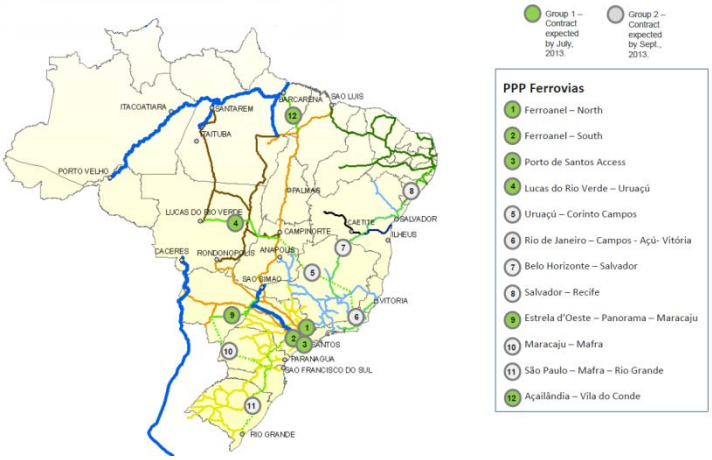
in Brazil that limits the export flow. Having said that, Brazil had record export flows out of the country this year, so they are moving.

I am certainly no expert in terms of Brazilian logistics. But, in talking with some of my cohorts down there, one of the things taking place is the government is going to the railroads to buy capacity and pay a certain price for it that will encourage long-term investment and maintenance investment in the railroads. They are willing to take the risk to sell that capacity. It is just a ploy, or what I would call a mechanism, to encourage investment in infrastructure. Like many of us here in the room who see this forward growth coming, they see it as well and they want to try to get in a position to be able to accommodate it. That is one of the programs they are doing.

At the same time, as Ken pointed out, there is a drag on the system. They are putting in more regulations from a trucking and cost perspective. The regulations with the hours a truck driver can work probably cost the industry about 25 percent on the pricing of truck freight this past year. There are some pluses down there where they are really moving. Maybe from a U.S. perspective you get more concerned, but there are also some minuses down there.

Map 4 is a futuristic look of what Brazil thinks about some of the projects they will do. You'll see there are a number of different projects out here that will take place. Much like the PNW, there is a lot of private investment in ports. We're in the process of building a port which is on the northern side of Brazil.

Map 4
Brazilian Infrastructure: Long-Term Projects



There are other people investing, like I mentioned earlier about $500 million of investment in the U.S. port infrastructure. There is about the same in Brazilian port infrastructure. Those constraints from a port perspective are getting taken off the table or people are working to take them off the table. The bigger issue here is getting it there and fighting through some of the truck regulations that puts them more on par with some of the U.S. regulations, finding ways to open navigable waterways, and finding ways to make rail investment.

Here is a comparison. These are always interesting. Railroad extensions have 300,000 kilometers of track in the United States. You have 30,000 kilometers of track in Brazil and, if you look at the country area, it is similar in size. Argentina has almost a little more track than Brazil, but they are probably about a third of the size. Brazil understands that and they are moving to make improvements.

For further comparison, to get from the middle of Mato Grosso to a port like Santos – a six- to seven-day trip of about 3,200 kilometers – costs $74 a ton on a good day. A lot of times there aren't good days and there are rail washouts, like I showed you. That can add another $20 to $25 a ton. It could very easily cost $100 a ton.

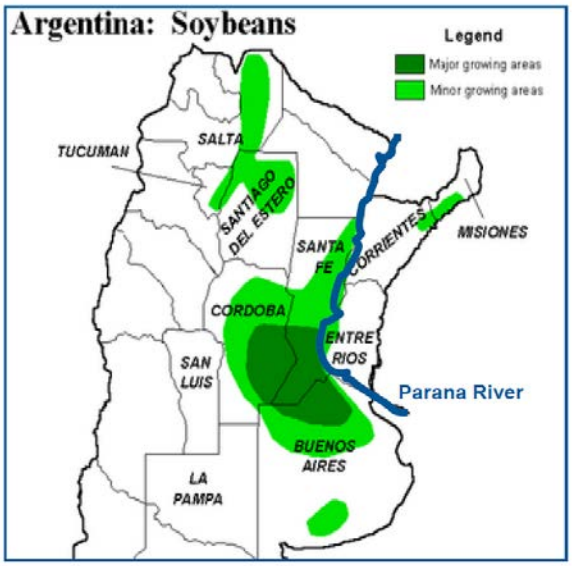
You do a similar run on rail out of, say, North Dakota to Portland – a four- to five-day transit time -- $51 to $56 a ton on a movement. You do the same move from Minneapolis down to New Orleans, again about the same distance of about 2,600 kilometers and it costs around $30 to $35 a ton. Paul's rail movements are like using Fed Ex, while barge movements may be more like using snail mail. As you can see it's a 25- to 30-day transit versus four to five days of working capital. There are all sorts of other benefits to moving it quickly, but those are dramatic changes from a cost-structure perspective, a perspective between what you see in the United States today and what you see in Brazil.

Again, I've gone down there a number of years. Over that time, I've heard they are making improvements. It's slow, but similarly, if you are ahead of your competitor, you don't just stand still and wait for them to catch you. You have to make those investments.

To touch on Argentina in terms of how the logistics structure works there, it is a much different situation. They probably have the most efficient grain flow structure that there is, just because of the resources. Politics is perhaps a bit less efficient.

The Parana River goes up through the growing region (Map 5). It's like bringing a vessel to the heart of Iowa. And it really is. If you look at the bottom, 85 percent of the grain going to the port is delivered by truck and it's near term, in many cases. Their need for a vast rail network is different. Their need for a vast barge network is different, because vessels go right to the loading terminal. It is like going to a terminal in the interior of Iowa. They have some advantages in that case.

Map 5



The Black Sea area – Eastern Europe, Ukraine, Russia – also has some advantages. Map 6 shows where the grain is grown. As you can see, it is grown very tributary to the Black Sea. Not much goes out in the northeast. Not much goes out on the west coast. Again, you are growing a lot of wheat and soft seeds in this region. The natural market for that is the MENA region of the Middle East and North Africa. So there is a natural flow there. There are a lot of handy size ports there. When I say "handy size ports," they have 25,000 to 35,000 ton vessel loading capabilities. That is somewhat typical in the Middle East and North Africa. In many ways, you have a market that is geographically protected.

Map 6

Source: ASOP, AgroAtlas

My experience in that area – I've traveled there a couple of times – is they are at least equal to or better than Brazil relative to infrastructure that is handling it. The rail structure is much better than what you see in Brazil. There are some issues relative to truck. Again, like the Gulf, you have a natural funnel that goes down to the best outlet they could possibly have to serve that Middle East-North Africa market.

In observations, we have to make significant investment to accommodate this future growth in terminals, bridges, waterways, and the [rail]. From a port-capacity perspective, private industry really drives that and private industry is doing that. You can maybe make the argument – maybe we are getting ahead of ourselves – we were probably behind by not building a U.S. terminal for 30 years. Now we've built one, we've added capacity to others, we've probably raced above the mark, and now it's a matter of growing into the demand growth.

Some of that is taking place in Brazil. As I mentioned, there are investments of $500 million in the United States and $500 million in Brazil. There are $200 million to $300 million being invested or has been invested in the Black Sea over the course of the last two or three years. So they are doing that as well.

From a U.S. railroad perspective – Paul touched on it – one way you can gauge it is to look at the efficiency of the railroads today versus ten years ago. They are vastly different. Not just vastly different because they are operating better, they are vastly different because they made a lot of investments, such as some of the things Paul talked about – double tracks and so forth. There are major improvements in that respect.

What we are dependent upon the government to fund is harder. In 1998 I managed our company's barge operation. I had the pleasure of serving on an association executive committee called MARC 2000, the Midwest Area River Coalition. It was made up of barge companies, grain companies, cement manufacturers, fertilizer companies, construction companies that all banded together to make a big push to upgrade these locks and dams. Well, 2000 was our futuristic view. Well, 2000 has come and gone. Today is 2013and – to Ken's point – not one of these lock and dam upgrades has been completed.

The Olmsted Lock is grossly overspent, but all the locks and dams on the Mississippi and Illinois Rivers are still out there. They were estimated as 50-year pieces of property. Just think about the assets you run. Can you run assets forever without making investments? Absolutely not. So, at some point in time, we really have to wake up and make those investments. In this type of environment under the budget constraints we're living with, it is not going to be easy. Thanks.