Modern tank car transloading points are compact, yet busy, industries. High-fructose corn syrup is moved by rail to locations such as the Tate & Lyle plant in Westborough, Mass.

A MODERN INDUSTRY FOR A COMPACT SPACE

Though small in size, a corn syrup transloading terminal offers plenty of switching opportunities

BY JIM LINCOLN
PHOTOS BY THE AUTHOR

IF SOMEONE ASKED YOU to name the three most-shipped products on CSX, your first guess would undoubtedly be coal – no surprise there. Next would come automobiles and trucks (still). Third? Would you have said corn syrup?

Though people have strong feelings, both pro and con, about high-fructose corn syrup (HFCS), this product – or rather the shipping of it – has been important to railroads since the 1970s. That's when the United States Secretary of Agriculture approved its production as a way to help struggling American corn farmers.

I never would have guessed HFCS was the third-most-shipped product on CSX. It makes sense, however, if you think about cars in a manifest freight. There may be more boxcars or covered hoppers, but there could be a variety of products in these cars. When you see tank cars labeled "corn syrup," it's either loaded with the sweet commodity or empty. Nothing else can be loaded in those cars.

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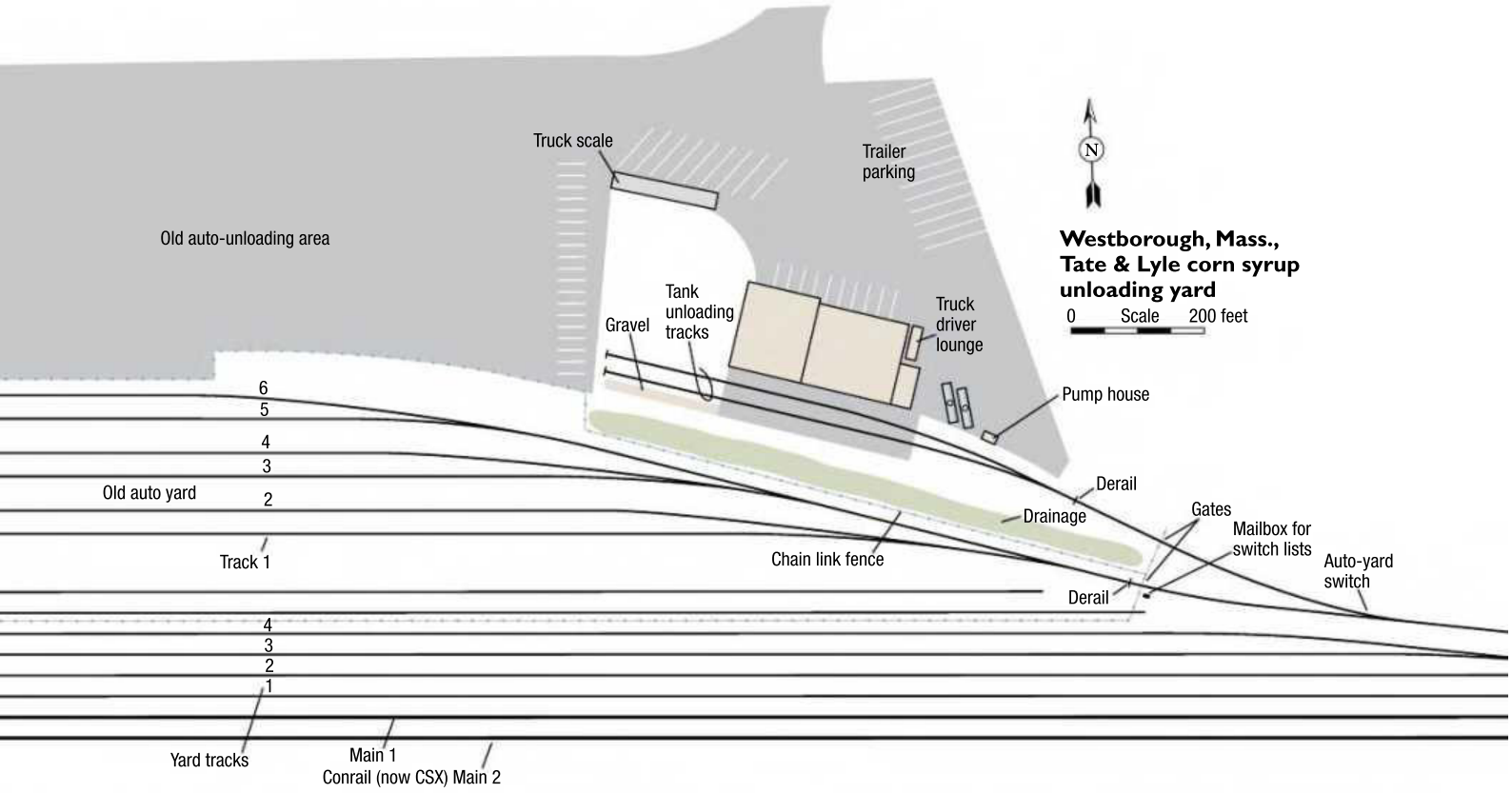
MODELING THE HFCS INDUSTRY

With high-fructose corn-syrup shipments down because of bad press and a general move away from sweetened soft drinks, it's still common to see corn syrup tank cars in a train. If you're modeling an era from the mid-1970s to the present, the HFCS industry and its products should be well represented.

"Wait a minute," you say. "I don't have that kind of space for one industry!" That may be true if you're thinking of modeling a plant that produces HFCS. To get some sense of the scope of modern corn syrup production, take a look at aerial photos of the Archer Daniels Midland (ADM) plant north of Cedar Rapids, Iowa, on Google Earth or using the Bird's Eye view on Bing. It's quite an impressive industry.



Modeling the destination of HFCS is a different story. Here we find a compact industry that generates a large volume of traffic, particularly by modeling standards. If you're modeling a metropolitan area, including one or more HFCS terminals would be a great traffic generator, even if you don't have a lot of space on your layout.

TRAFFIC THEN AND NOW

The Tate & Lyle (formerly Staley) terminal in Westborough, Mass., typically receives five cars per day during the week, with an equal number of empty outbound cars. The terminal is also switched on weekends occasionally to prepare for the work week.

Until a few years ago, the ADM terminal adjacent to CSX's Nevens Yard in Framingham, Mass. (8 miles east of the Tate & Lyle terminal) received two or three cars in and out five days per week. The Framingham terminal is now closed; the traffic is now apparently handled at a Trans-flo site in Worcester, Mass., on the Providence & Worcester, 15 miles west of Tate & Lyle. Ken's Foods, north of Framingham, receives corn syrup cars every other day, and there's another HFCS terminal served by the Springfield Terminal near Ayer, Mass.

Those numbers are typical of traffic around Boston today. A few years earlier, however, the terminals were much busier. For example, the terminal in Framingham

This view of the south side of the Tate & Lyle plant was shot from the former auto-unloading yard. The yellow paint on the web of the rails in the foreground indicates where the clearance points are for spotting cars.

A gate and derail protect the entrance to the Tate & Lyle unloading tracks. The former Conrail (ex-New York Central) yard is in the background.

These two photos show how the hoses from the pump house at Tate & Lyle are draped along the track where the corn syrup tank cars are unloaded. The plastic blocks in the foreground keep the hose ends off the ground.

(still called Amaizo's even though it was owned by ADM) had three tracks that could hold 15 to 20 tank cars. Within the last eight years, that terminal required a "full switch" – all cars in and out – twice a day, five days a week. That plant was receiving 40,000 tons of HFCS per month, or about 30 cars per day.

SWITCHING THE TERMINAL

What makes a corn syrup transloading site so interesting is the amount of time it takes to switch. It's not as simple as putting identical black tank cars on a pair of tracks. At the ADM terminal in Framingham, a local crew switched just this industry. It wasn't uncommon for inexperienced crews to run out of hours switching the plant just one time. It seems pretty straightforward: 15 cars in, 15 out. So why does it take so long?

Corn syrup (at least HFCS used by Tate & Lyle) comes in at least six grades: 55 (or 5500), the thinnest grade and the one used in soft drinks, is the most common; 100; 130 (or 1300); 180; 200; and 300. The latter is the thickest grade and common in ice cream. The other four are used by bakeries and candy companies.

The different grades of corn syrup can't be mixed. If a storage container has a particular grade in it, the container, lines, and hoses leading to it all must be for the same grade. If they aren't, they must be steam cleaned to prevent cross-contamination.

To that end, the switch list we use to set out cars at the three-track ADM terminal requires that each car be placed in a specific spot. This is often different than the order in which cars arrive in the inbound train. We therefore have to block loaded cars, remove the empties, and put the still-to-be-unloaded cars back in their original spots.

The Tate & Lyle terminal switch is generally simpler because it doesn't require specific spotting unless cars with other than 5500-grade corn syrup ("specials") are in the cut. These cars must be placed in specific spots and put back in the same spot if they aren't empty and the surrounding cars are. This plant has two tracks with a capacity of 13 cars – five on the outside track and eight on the inside.

A wrinkle: Cars on the inside track foul the switch when they're spotted. What makes switching this plant interesting is the need to put cars back in the spot from which they were pulled when

ONE IS A MILLION

NO, THE TITLE ISN'T A TYPO that should read "One in a million." Did you know that when you see a loaded corn syrup tank car filled with 5500-grade high-fructose corn syrup (HFCS), that single car carries enough sweetener for more than a million cans of soda?

The cars used in the HFCS business come in two varieties, 17,600- and 19,600-gallon cars. The majority of these cars were built by Trinity Industries. The carbuilder produced the 17,600-gallon cars, most of which are still in service, between 1984 and 1998. Production of the larger capacity cars started in 1998 and continues today.

Since most loading and unloading points have fixed apparatus, manufacturers can't lengthen the cars to get added capacity. Instead, they make the tank larger in diameter. To do this without exceeding clearance restrictions, the side ladders seat into indentations in the tank. The ladders allow employees at the industry to reach top hatches and hose connections.

Corn syrup tank cars are usually kept in good condition. This is presumably because the cars are used in food service. It's not unusual to have a 17,600-gallon car built in the mid-1980s look as new as a contemporary car.

Full-size corn syrup cars are painted with medium-gloss paint, whereas the paint used on models is closer to an eggshell finish. Unlike most model freight cars that, sans weathering, don't look realistic, an out-of-the-box corn syrup tank car model is actually not glossy enough.

Atlas made models of the 17,600-gallon cars in N, HO, and O scales. InterMountain offered a 19,600-gallon car in HO. Walthers produced a car of the right length and general size as a HFCS tank car, and there are many out there lettered as such, but they're not exact replicas of the Trinity cars used in this service.

Whichever car you choose, if you're modeling from the 1970s to the present, having several corn syrup tank cars in a freight train is a must. – *J.L.*

the car next to them is an empty. Also, cars with non-5500-grade corn syrup must be placed in designated spots.

In addition, the three cars farthest from the building on the inside track can't be unloaded from those spots, but they can be heated there to make later unloading easier. (Cars are loaded "hot" and retain enough heat for easy unloading during the warmer months but must be reheated during the winter.) Heated cars are moved to unloading spots to replace empties, and new inbound cars are then placed on the heat-only spots.

The Tate & Lyle plant is adjacent to the old Westborough auto unloading yard, which – until a derailment took out the yard ladder – was used for tank car storage. Tate & Lyle generally keeps 10 to 20 cars on hand. This also presents a problem, as HFCS has a shelf life of 180 days. If the product hasn't been unloaded within that time, it's deemed unfit for human consumption and shipped elsewhere to be turned into ethanol.

Good local crews put the newly arriving loads on a separate storage track or "bury" them so the older cars are first out and easier to get at. When the auto yard was still active, and now that the ladder is unusable, all switching had to be done on the lead. This made (and makes) the switchman's job significantly more difficult. Since a lack of storage space is common on a model railroad, a corn syrup terminal would make for some interesting, and time-consuming, switching.

Andy Sperandeo built this corn syrup terminal on *Model Railroader*'s HO scale club layout, the Milwaukee, Racine & Troy, following Jim Lincoln's article. The modeled industry has spots for five tank cars. Photo by *Model Railroader* staff

MODELING AN HFCS TERMINAL

If you're interested in modeling an HFCS terminal, your biggest decision will be whether to go "tankless" or not. The Westborough transloading point has all of its storage inside the building, whereas the Framingham terminal had four outside storage tanks. This affects how large your main building must be, as there is basically the same amount of storage at both facilities.

In addition, you might want to take a look at different transloading points in your area to see what type of above ground fixed piping they have. There's very little at Westborough, but quite a bit at Framingham. A terminal like Framingham would be more visually interesting, but the Westborough terminal would be significantly easier to model.

The main building at Westborough is 60 x 125 feet, dimensions I obtained not by measuring the building but by visiting the Westborough tax assessor's website and entering in the location's address. Such sites can be great modeling aids, as they typically provide the lot size, aerial photographs, and sometimes the dimensions of the buildings. You can also obtain the information by going to the local assessor's office directly. All of this information is in the public domain.

The driver lounge for an on-site trucking company at Tate & Lyle is supported on concrete blocks. Extra hoses for tank car unloading and trailer tires are stacked alongside the small barn-shaped storage shed.

Permanent piping runs along the east side of the Archer Daniels Midland unloading terminal in Framingham, Mass. One pipe serves each unloading track. There are also compressed air and steam supply lines.

Here we see the front and tank side of the Cargill high-fructose corn syrup plant in Framingham. This is easy to model with commercial kits, as Andy Sperandeo showed in the April 2011 issue of *Model Railroader* (see page 69).

Both buildings can be easily modeled using Pikestuff or City Classics kits in both N and HO scales. They can be kitbashed to closely resemble a particular building or used straight from the box. The important thing to remember is that you'll need at least one large or two smaller roll-up doors for tractor trailers to back into the building. The doors should be 13'-6" to 14'-0" high. You will also need to have at least one or two personnel doors on the track side and at least one door into the office in front.

The steam shack and pump houses can be modeled in either plastic or wood. Walthers has an industrial piping kit. The trailers are a different story, as they will have to be scratchbuilt in any scale. Several trailers are always parked at HFCS transloading points.

This prototype lends itself to progressive detailing if you want to get a model on the layout quickly to enhance operations. There isn't a lot of detail that smacks you upside the head and says, "You better put this on, or it won't look right." As you move closer in, lots of detail becomes apparent, but it could be added at a later date. That's perhaps the reason that the Framingham facility is, to my eye, a more interesting subject: All you have to include are the outside tanks for it to look like a superdetailed model without actually being one.

The driver lounge for an on-site trucking company at Tate & Lyle is supported on concrete blocks. Extra hoses for tank car unloading and trailer tires are stacked alongside the small barn-shaped storage shed.

For more information on the tank cars used in HFCS service and available models in HO and N scales, see "One is a million" on page 69.

If you're a modern-era modeler looking for a heavy-on-traffic, light-on-space industry for your layout, consider a high-fructose corn syrup transloading point. It will provide some delightfully sweet switching challenges for you and your operating crew. HTMTR