

GO WITH THE (TRAFFIC) FLOW



Train 376 on the Dixon, Wyandot & Lake Superior passes Canova Cannery on the north edge of Midway as it leaves town. Number 376 originates at Defiance Yard, south end of the railroad, and is a "through job." Despite that status, the train sets out/picks up blocks of cars at Ebner,

nearly halfway up the division. These Ebner loadings may contain cars for Ebner proper as well as cars to be forwarded to other towns by local trains originating at Ebner.

You've got a waybill system in place—now establish your traffic patterns and train work assignments

PART II/Designing operations

BY JOHN SWANSON

PHOTOGRAPHY BY THE AUTHOR

In the previous installment of this series, which is devoted to prototypical traffic flow on a model rail system, we looked at a simplified waybill procedure for freight-car forwarding. But setting up a car card system is only a part of creating a realistic rail transportation system. We need to step back and take a gander at how our modeled systems fit into a much larger world—even though we probably haven't (or won't ever) model that world. This is most important in achieving a believable traffic base and flow.

Again, we'll use my own Dixon, Wyandot & Lake Superior as a sort of proving ground. What I explain can be applied to any model system, whether you are faithfully recreating an actual railroad (or a part of real railroad) or

you have devised your own fictitious or "what if" system set in the real world.

The system map (fig. 1) of the Wyandot shows the entire conceptual railroad, most of which networks the western half of Illinois. (Like many railroads of the era, it never made it to some of its name points. You can see where Dixon really is, and Lake Superior is some 500 miles north of Dubuque!) The cities on the maps indicated by open circles are actual cities and their actual locations; those indicated by solid dots are either fictitious or they are actual cities that have been relocated for one reason or another (don't forget, as King of your railroad,

you can do anything you want—even move cities in a single bound).

Highlighted on the main map is that portion of the Wyandot I have actually modeled, the 106-mile Alton District. While traffic to and from other parts of the Wyandot, as well as other railroads, cities, etc. is taken into consideration, the main focus is on the traffic's impact on the Alton District.

Train numbers

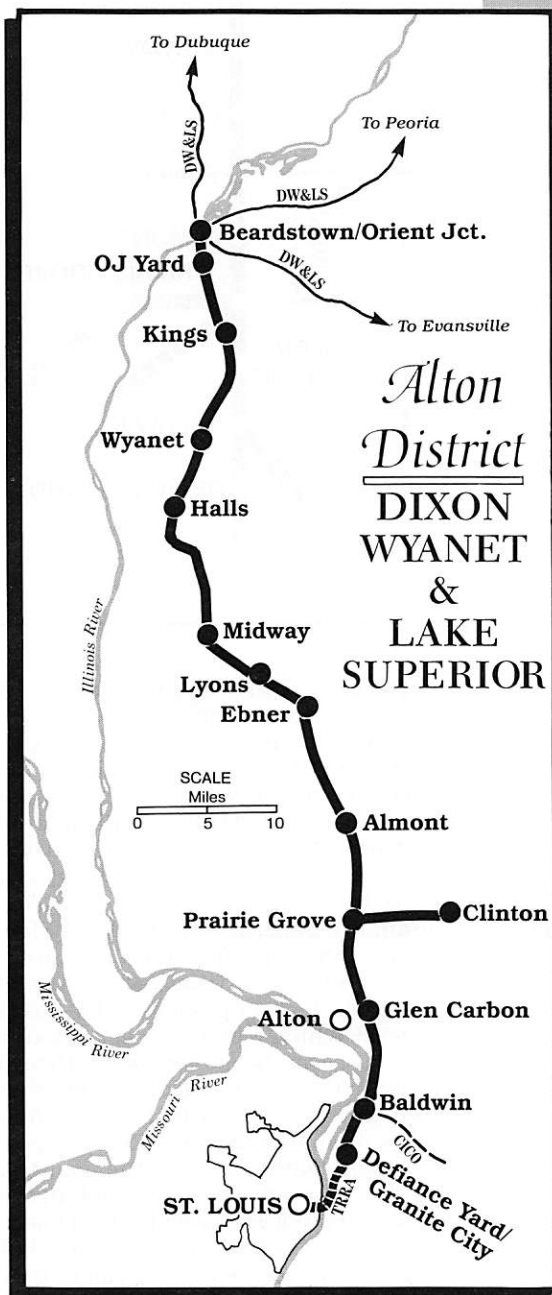
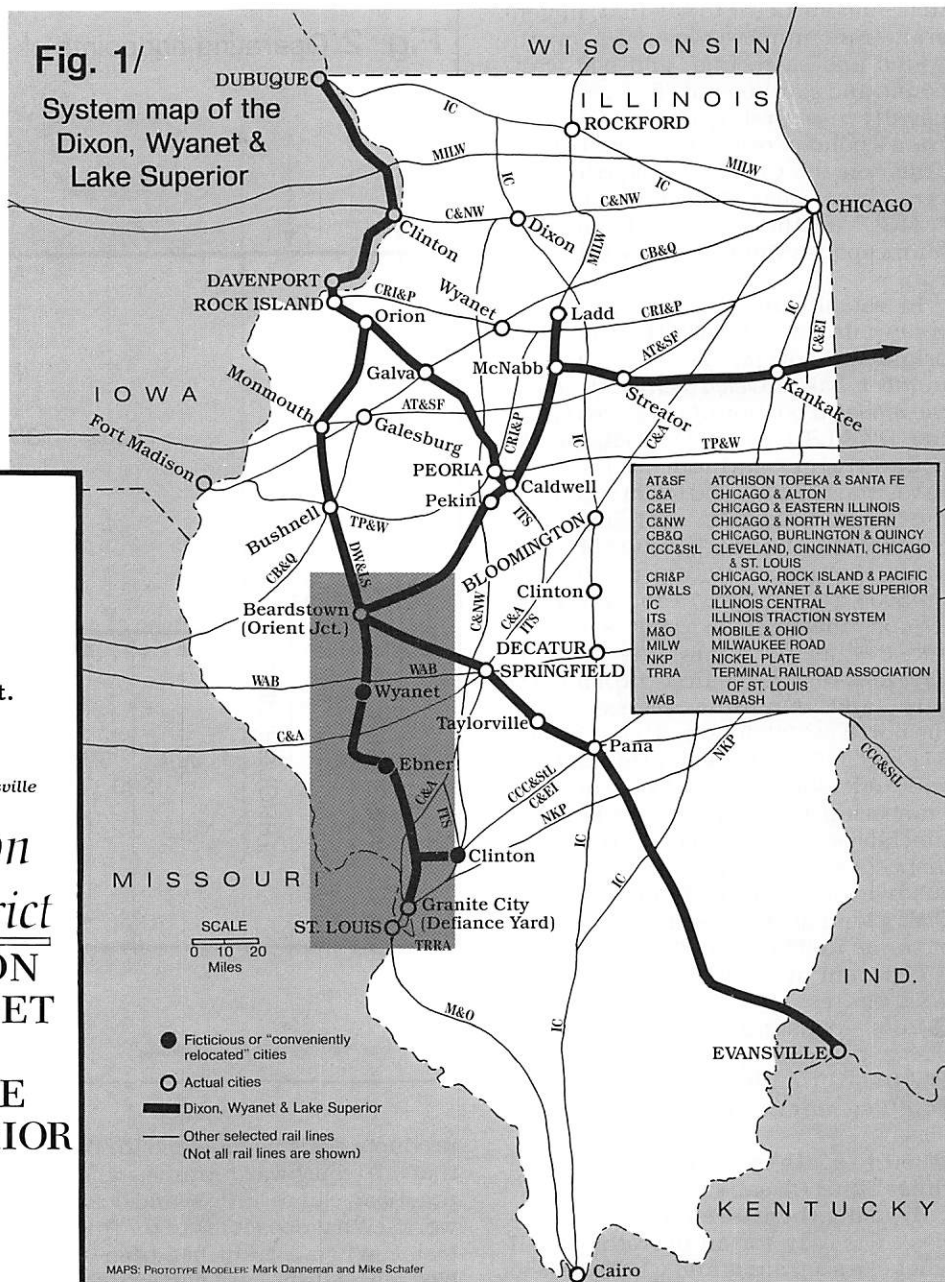
On routes with a lot of traffic, trains usually have schedules and numbers. A train operated in addition to the scheduled trains was (is) called an "Extra." Train numbers, schedules and trains operating in Extra status are necessary for keeping track of movements and are particularly important in regard to train orders for setting up

meets and passes. (The current trend on some railroads is train symbols instead of numbers, but this does not affect what we're talking about here.)

CTC (Centralized Traffic Control), which became widespread toward the middle of this century, has in some cases pre-empted the use of train numbers (they're instead run as Extras) and schedules. Nonetheless, even in such cases, you'll always find a definite pattern to the traffic.

We won't get too deep into the complexities of train numbers/symbols, train orders, CTC and the like here—we could fill a whole article on just

Fig. 1/
System map of the
Dixon, Wyanet &
Lake Superior



A carload of coke for Hayes Industries (Wyanet) in OJ Yard. The car was "received" from the Norfolk & Western via the Southern at Evansville, Ind. From there the car moved up the Wyanet's Evansville line to OJ Yard where it entered the Alton District.



that—but suffice it to say that, in general, train numbers are even northbound and eastbound, and odd westbound and southbound. Train symbols usually use first letter or two of a train's point of origin and destination. Thus, on the Chicago & North Western, if you hear them talking about "EMGC" on the scanner, it's an East Minneapolis (Minn.)-Granite City (Ill.) run.

In establishing train numbers on your railroad, consider their point of origin and how far the train with that number has traveled before it enters the modeled portion of the railroad. On the DW&LS's Alton District, northbound trains originate at Defiance Yard, starting at 12:01 a.m., and are numbered 370, 372, 374 and 376. Southbound trains originate at Peoria, again starting at 12:01 a.m., and are numbered 371, 373, 375 and 377. BUT, 375 originated at Peoria at 8:01 p.m. and 377 at 10:01 p.m. the previous day. As a result, the first train into OJ Yard—and the Alton District—from the north is 373, followed by 377, then 371 and 375. Think about this and you will understand the "out of sequence" numbering that appears in employee timetables of prototype railroads for districts after the starting district (or subdivision). Conversely, on the Peoria District north of OJ Yard, the sequence of trains in 374, 376, 370 and 372.

The train number groupings on the Wyanet are:

- 20's—passenger trains (First Class)
- 370's—through jobs (Second Class)
- 380's—north-end locals (Third Class)
- 390's—south-end locals and mine runs (Third Class)

By using these different number series, it is easy for an operator to tell what class a train is and what its basic function is. Figure 2 shows the scheduled trains serving the Alton District and the points between which they operate.

Traffic sources

When through traffic is considered, take into account the era you model. In the late 1920s era I model, the main traffic southward would be oil field equipment and supplies, other manufactured goods, processed foodstuffs, farm equipment and supplies, automobiles and automotive products. Generally, most of the loading would move in boxcars. There is much more to consider, but it all comes down to the doing the research for your own line and time. A general comprehension is all that is necessary to start—refinements will come with time and knowledge.

Most southbound loading patterns on the Wyanet involve non-perishable

Fig. 2/Operating endpoints of trains on the Alton Division

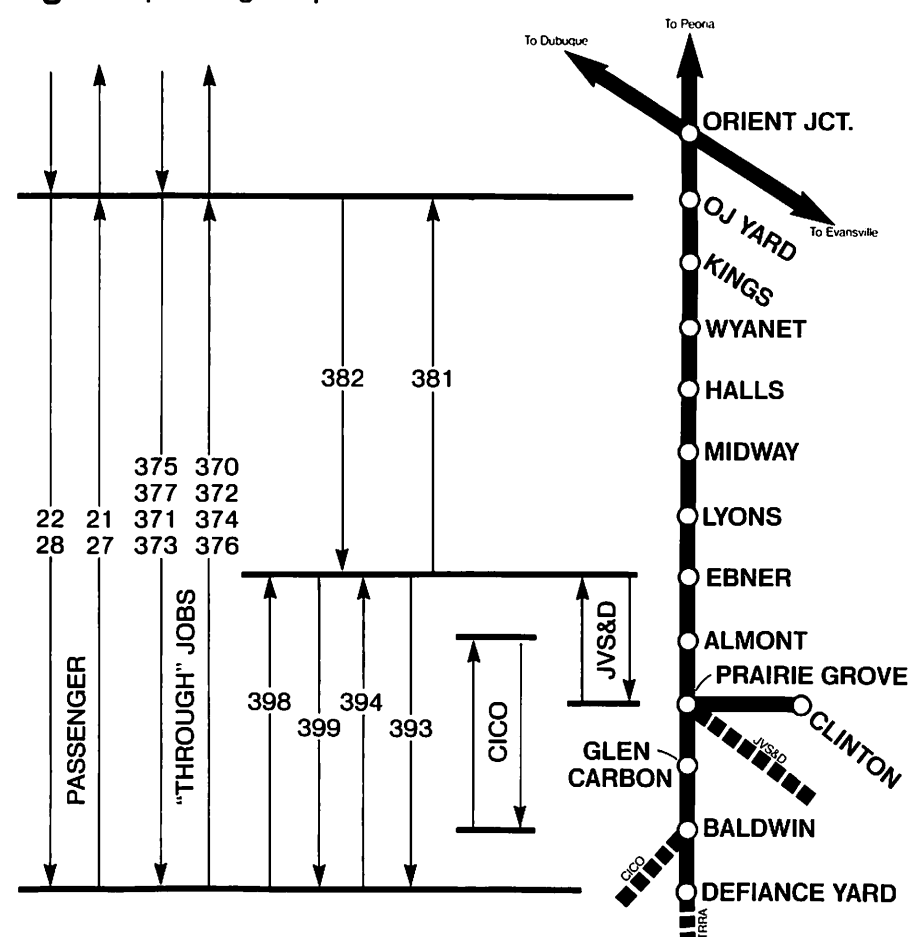


ILLUSTRATION: PROTOTYPE MODELER: Mark Danneman

products. This permits me to consider that all southward trains, whenever practical, can be "filled" and do on-line work. (What does it mean to "fill out" a train? When a train has been assembled with all the cars destined for that train and the tonnage rating has not been exceeded, then the train can be "filled out" to its rated tonnage with less-important cars [such as empties] that need to be moved.)

Northward traffic on the Wyanet would be perishables, agricultural products, forest products, petroleum products, merchandise and manufactured goods. The perishable traffic would be protected and moved. As blocks of perishables are received from the TRRA (Terminal Railroad Association of St. Louis) at Defiance Yard, they would be filled with any northward loading already on hand and sent on their way.

So, I felt that on the Wyanet at least one of the northward trains should be a "hotshot" handling perishables and any time-sensitive merchandise. I made train 370 (called for 12:01 a.m.) the hot one with rights over everything to put the perishables into Peoria

about 6 a.m. and into Kankakee (for Chicago connections) about 9:30 a.m.

And then there were the railroads that were "hot" overall, such as the Nickel Plate and Wabash. They moved the cars, period. There was little or no distinction made as to lading. If the car was to move, say, eastward, it moved on the first available train. This again is a general rule. A Nickel Plate fan can probably cite quite a few exceptions. But, this attitude of "move the traffic as fast as possible" (it's called *service*, which may be a lost art today in some cases) is one consistent thread that ran through those prototypes that were known for their fast service. And keep in mind that Nickel Plate, as possibly the fastest road in the country, raised its speed limit to 35 mph in the 1930s. It's not necessarily train speed as such that made those roads fast, but the expeditious way in which they handled traffic.

Once you have established the basic pattern and numbering of the through jobs, it's time to consider the local traffic loading and patterns to establish both local freights and to see what effect local loading might also have on



Wyandot 2-6-6-2 No. 839 is on the ready track at OJ yard. Today, 839 is the power for an Almont turn, an Extra called to handle the overflow tonnage for Ebner and mine empties. The train will turn back at Almont and handle any available northbound loadings back to OJ Yard.

through jobs. That last point is often lost on a lot of modelers.

Establishing traffic patterns

On the Wyandot, the towns between OJ Yard and Ebner (the north end) are a combination of farming and industrial locations. Between Ebner and Defiance Yard (the south end), the towns are all farm-oriented. Also, the south end of the railroad runs through the coal fields north of St. Louis that were quite active during the era I model (most had played out by the 1960s). Alton District towns and their industries are as follows:

Kings: Single-ended grain elevator siding, worked from the north end.

Wyandot: Three elevators; one feed mill; coal, lumber, oil and supply companies; freight house; team (public) track; scrap yard; and the Hayes Industrials firm.

Halls: Small farm town.

Midway: Three elevators; a feed mill; coal, oil and lumber supply houses; freight house; team track; and Cannova Canning Co.

Lyons: Farm town.

Ebner: Farm town with a mid-line coal chute and a small yard for the originating/tie up of locals.

Almont: Farm town and location of Central Illinois Consolidated Coal Washer and a yard for empty hoppers.

Prairie Grove: Farm town and location of Orient No. 3 Mine and junction with Clinton line; also a set-out and pick-up location for Clinton traffic.

Clinton: Large industrial city.

Glen Carbon: Farm town and location of a Glen Carbon Coal mine.

Baldwin: Farm town and location of Macoupin County Carbon Coal No. 4 Mine.

In the previous installment we talked about a couple of staged runs integrated with the Wyandot system. One is the Central Illinois Coal Co. (CICO) train which comes from strip mines on CICO trackage. The train enters Wyandot trackage at Baldwin, runs to Almont and sets out coal to be cleaned at the Illinois Consolidated Coal Washer. It picks up empties from the hopper yard and returns to CICO trackage.

The other staged run is the JVS&D shortline run, which enters the DW&LS at Prairie Grove, runs to Ebner, yards the train and ties up. Later, the train goes back on duty, picks up loading at Ebner yard and departs southward; en route back to JVS&D track, the train fills with empty hoppers from the hopper yard at Almont.

I established Ebner to be a tie-up point for the locals because it is pretty much at mid-point on the Alton District, and in the 1920s there would have been a wealth of local business—too much for an OJ Yard-Defiance local. The prevalence of business that was shipped by rail back then requires not only having the locals work only 50 miles of railroad, but also that each runs only one way in a given work period (versus “turn” locals which could work out and back within the 16-hour work day standard of the era).

So, north of Ebner are two locals, No. 381 OJ Yard to Ebner, and 382 Ebner to OJ Yard. South of Ebner the locals are 393 (Ebner-Defiance Yard) and 394 (Defiance to Ebner). In addition, there are two mine runs between Defiance Yard and Ebner, No. 398 northbound and 399 southbound.

There is one service consideration of note for the north end locals. To prop-

ABOUT SOME OF THAT TERMINOLOGY

Loading

The term “loading” has been used frequently in this installment of “Go with the (traffic) flow.” But its meaning may not be so obvious. Loading is a railroad term for freight cars—empty or loaded—destined to a station, or originating at a station. It can be one car or a block of cars. Sometimes a loading destined to a station within the division or subdivision (not including the terminal points to the division or subdivision) is referred to as a “short loading,” meaning it’s not going all the way through. “Long shorts” are loadings dropped at a station within a division for forwarding to their final destination(s) by another train.

Station

A “station,” as it relates to railroading, is a named location. There may, or may not, be a railroad agent’s building (depot) at the station, but there is almost always a sign naming the station location. “Station” and “depot” often are used interchangeably, but in railroad operation you should keep their distinctions in mind.

Spot

The name of the station agent’s dog? Maybe. But as far as railroad terminology is concerned, to “spot” a car means to position it as required by the shipper or receiver for proper loading/unloading.

List and call times

The “list” time you see on train work messages, call sheets, etc. illustrated in this series is the time a train’s schedule goes into effect. This is not to say that, at 12:01 a.m., train 370 is going to lurch out of Defiance Yard, even though its schedule calls for that departure time. As much as anything, a schedule goes into effect as a point of reference for the dispatcher; the vagaries of getting a freight train together and sent out over the road rarely have it precisely following its schedule (there are exceptions, of course, such as today’s “hot” intermodal trains laden with UPS trailers), but it is important for the dispatcher to know where the train is in relation to its schedule for proper issuance of train orders. A “call” time is when a crew is called to duty for a specific train; the call time may or may not coincide with the list time. And in some cases a list time may have a spread to it of, say, two to three hours.



Wyanet on the DW&LS, looking northward, circa 1929. Largest customer in town is Hayes Industries, part of which is visible at right. North from here the main line begins its descent into the Illinois River valley. The grain eleva-

tors, scrap yard, bulk oil facilities and other industries can keep the north end locals busy at Wyanet for hours on some days.

erly service an industry, the objective is to pull the day's loading and "spot" (position set-out cars) at the industry for the next day at the end of a work day for that industry. With this in mind, I assign 382 to work Halls, Wyanet and Kings, scheduling 382 so it won't get to Wyanet until the afternoon to work Hayes Industries. On its way north from Ebner, 382 also sets out, at Midway, any Midway and Lyons cars that may be in the train for train 381 to handle. Why? Because these cars are easier switched into their final position by a southbound train (381 in this case).

Number 381 out of OJ works Halls, Midway and Lyons; this puts 381 into Midway in the afternoon to work Canova Canning Co. This planning for north end locals splits up the work and allows the two trains to get over the road in a reasonable time (usually 14-16 hours—which may sound like a long time by today's standard of 12 hours, but was the norm back then).

One more factor to consider is the route of your line and the grades encountered. On the Alton District of the Wyanet, the main line climbs out of the Illinois River valley south from OJ Yard, cresting near Wyanet. Northbound out of Defiance Yard the line is climbing out of the Mississippi River valley to Glen Carbon. These ruling grades must be taken into account and can have an important effect on how traffic is handled (not to mention the motive power required to move the tonnage).

Blocking traffic

To effectively handle traffic over a district you must break that traffic down into basic classifications or blocks. Not doing this will have you looking at a sea of cars and being unable to effectively handle the traffic (not to mention discovering that you'll need a "mega yard"). We will get into yard design and operations in a future installment; right now, we are still in the process of establishing what each train will carry and what each will do to keep the traffic moving.

On the Wyanet, through trains that continue north from OJ Yard enter the staging yard, so, for now, they are not a consideration. Southbound out of OJ, the basic traffic blocks are:

Through cars—cars for Defiance Yard.

Mine empties—to be used as fill and set out in empty-hopper yard at Almont.

Clinton loading—all cars for Clinton.

Wyanet and Kings loading—in block for head end of 375; to be set out at Wyanet for No. 382 to handle.

Short loading—cars for 381; cars for Midway, Lyons and Halls.

Ebner loading—cars for Ebner, Almont, Prairie Grove, Glen Carbon, Baldwin and the JVS&D; these cars all set out at Ebner.

The short loading on 381 is heavy, so to avoid either double-heading or doubling the hill to Wyanet, the Wyanet and Kings cars are handled on the

head end of 375. If the addition of these cars on 375 requires an additional locomotive (better to have an additional locomotive on a through job than on a local—such would be a hinderance on a working local), 375 can be filled out with more mine empties.

Ebner loading includes all cars for the south-end local (393) plus the cars for Ebner proper and the JVS&D. Having a train handle this Ebner loading has, very often, been the classic example of the "way freight syndrome" on the Wyanet. A copy of the work message for 373 (fig. 3) is reproduced here. (All trains get work messages—along with the waybills discussed in the previous installment—so the train crew knows what to do. Other sample work messages are shown in fig. 4.) Despite this work message, I find that, time after time, a crew, if unfamiliar with 373, will set out just the Ebner cars, at Ebner, and leave town with the rest of the "long short" cars (those to have been set out at Ebner for 393's train). And then the crew might ask, "I've got cars for Almont, Prairie Grove, etc . . . I work those towns, right?" Nope!

I guess this is the result of way-freight operation as it has traditionally (i.e., incorrectly) been presented in much of the model railroad press. The (very) prototype practice of setting out cars for further handling *by another train* has not been considered. Much of what has been presented as "fact" in the model railroad press is in reality pasture pastries—small wonder the

crew of 373 did not understand what was supposed to happen. O.K., so this series is *not* the answer to everything, but it will, I hope, get us all to look a little more closely at how the prototype does things. Next time you talk shop with a railroader, instead of asking if the railroad is repainting its GP40s, ask which trains handle what kind of traffic and how that traffic is blocked, and which trains forward traffic for other trains to distribute. I'll bet you'll absorb a great deal of information you can take right home to your own scaled-down system.

Oops. I think I'm digressing. O.K., O.K.—I'll get down off the back platform of the Wyanet business car and get back to what I was talking about!

Anyway, with the basic blocks at OJ Yard in mind, southbound trains at OJ and their loading are as follows:

Train	Call time	Loading (consist)
375	2:01 a.m.	Through cars; Wyanet and Kings cars on head end; fill with mine empties
377	2:01 p.m.	Dead-freight clean-up job; fill with mine empties; pick up any Defiance loading at Ebner and Almont
371	8:01 p.m.	Clinton loading; fill with mine empties; pick up Defiance loading at Clinton
373	10:01 p.m.	Ebner loading; fill with mine empties; pick up Defiance (southward) loading at Ebner; set out any Clinton loading picked up at Ebner at Clinton; fill at Almont with any south coal on hand
381	9:01 a.m.	Local freight; short loading (ties up at Ebner)
21	6:31 a.m.	Passenger, express and mail from points north for St. Louis
27	7:01 p.m.	Passenger local (gas-electric)

The blocks at Defiance Yard are:

Through cars—cars for OJ Yard and beyond.

Clinton loading—all cars for Clinton.

Short loading—cars for train 394, Baldwin, Glen Carbon, Prairie Grove and Almont.

Ebner loading—cars for Ebner, Lyons, Midway, Halls, Wyanet and Kings.

Mine empties—line up on train 398 (mine run).

Again, considering the blocks, the trains northbound at Defiance are:

Train	Call time	Loading (consist)
370	12:01 a.m.	Through perishables and merchandise
372	1:01 p.m.	Dead freight; pick up coal at Almont; fill to tonnage at Ebner with north loading
374	8:01 p.m.	Clinton loading; pick up north loading at Clinton; set out any Ebner loading picked up at Clinton at Ebner
376	10:01 p.m.	Ebner loading; pick up north loading at Ebner
399	3:01 p.m.	Mine run; works Orient No. 3 at Prairie Grove and washer at Almont; lines up north and south coal in hopper yard at Almont; handles all short coal loading (including Clinton traffic) to Ebner

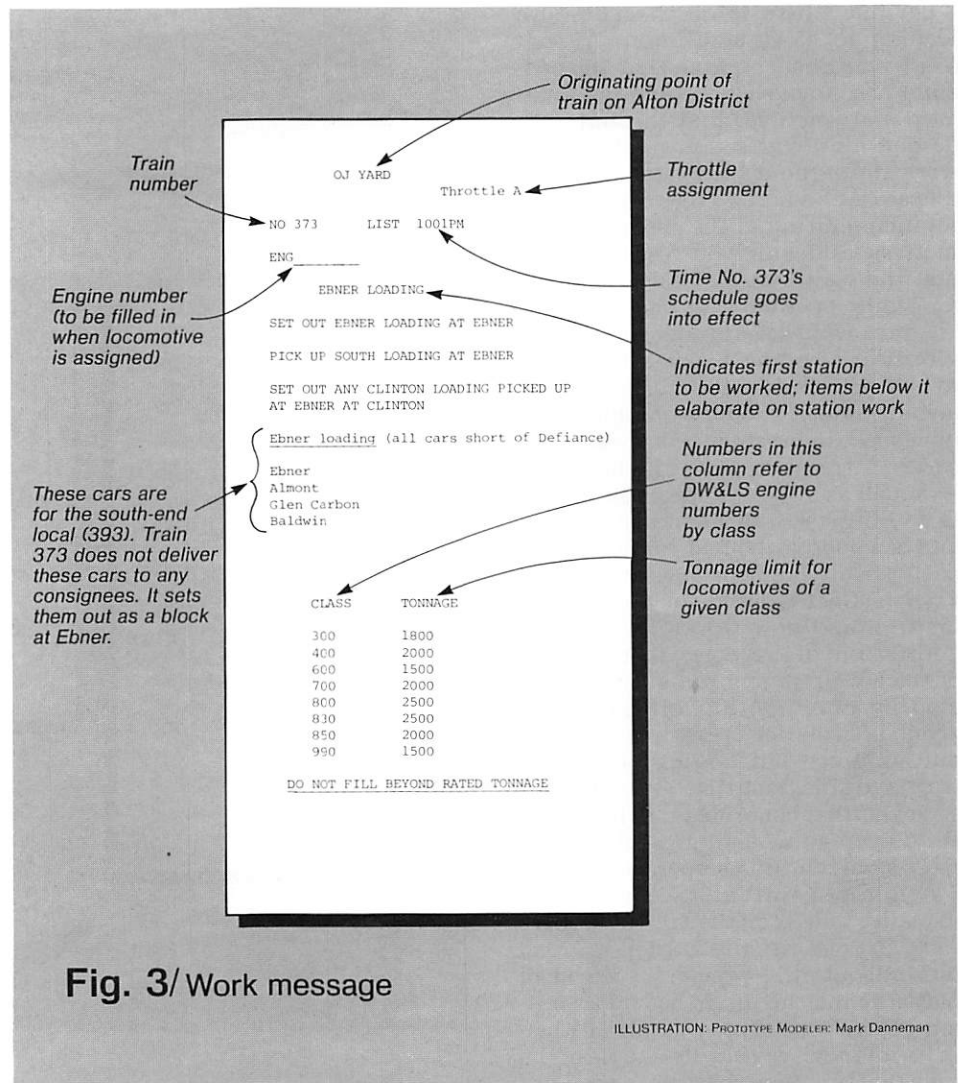


Fig. 3/Work message

ILLUSTRATION: PROTOTYPE MODELERS: Mark Danneman

22	5:31 a.m.	Passenger local (gas-electric)
28	5:31 p.m.	Passenger, express and mail from St. Louis for points north

At Ebner, the trains are:

Train	Call time	Loading
382	9:01 a.m.	North local freight (ties up at OJ Yard)
393	8:31 a.m.	South local freight (ties up at Defiance Yard)
399	3:01 p.m.	Mine run; works mines at Glen Carbon and Baldwin (ties up at Defiance Yard)

Staged runs:

Central Illinois Coal Co.: Called at KY tower (south end of Baldwin) for 12:31 a.m.; enters Wyanet trackage after passage of train 370. Runs to Almont, delivers cleaner coal to washer, picks up empties from hopper yard and makes return trip to CICO trackage.

JVS&D Railroad: Call time at Prairie Grove is spread between 2:01 a.m. and 4:01 a.m. Enters Wyanet trackage, runs to Ebner, yards train and ties up. List for return trip is between 11:01 a.m. and 1:01 p.m. Gets train from Ebner yard, fills with empty hoppers at Almont and returns to JVS&D at Prairie Grove.

Clinton is a large industrial town (largest city on the Alton District). By having the two 8:01 p.m. trains (371 and 374) handle the Clinton loading, the day's outbound loading from Clinton is moved out and the inbound load-

ing is on hand for the Clinton switchers, which go to work at 12:01 a.m. (This also gives the poor souls who work Clinton time to get the switching done. Currently there are three jobs at Clinton; I said it was large.) All Clinton cars are dropped/picked up at Prairie Grove from mainline trains so directed, and the Clinton switchers come out to Prairie Grove to set out and pick up the Clinton blocks.

With Ebner being the origin or tie-up point for a total of eight trains, there is a respectable amount of work for the Ebner switcher to do. Having the trains that handle the Ebner loading (373 and 376) called for 10:01 p.m. on the fast-clock "day" (i.e., two "fast hours" before the end of the operating session) has those two trains on line at the start of the next operating session. Usually 373 is at Midway and 376 at Almont as of midnight. This arrangement gets the cars to the Ebner switcher early on in the next session (and also painlessly puts two people to work in the middle of the railroad at the start of the next session) so that that operator can start building the trains that originate at Ebner.

On line, there is north and south loading to move at Clinton, Almont (coal) and Ebner. Add to that the constant need to move mine empties at OJ Yard and you'll see that through jobs do end up doing set-out and pick-up work throughout their runs, with the dispatcher and crews figuring out the tonnage rating of the assigned locomotives. Suddenly you realize it's not just the way freights and locals that are fun to operate!

Again, this series is not meant to be a glorification of the Wyanet. It is meant to help you analyze the traffic on your layout—how it should be handled and how you can create a prototype-based series of trains to move the business. As much as anything else, this article is an outgrowth of my second layout and of a buddy who had particular impact on railroad model operation, Chet French. Chet worked for the Illinois Central (and now works for Chicago Central) out of Freeport, Ill. (real home of the DW&LS), and would frequently stop by after getting off work. We spent hours—not operating, not layout building—but *talking*, analyzing traffic, trains, fast time and other abstract (at that time) ideas as they related to railroad modeling. Such was almost as much fun as operation itself.

I digress again, but it seems strange to realize that, back then in 1972, there were articles in the model railroad press about "the wonderful world of plastics" and the fun to be had in "kit-mingling." Prototype operation, then in its infancy, was hardly a topic of the time. Fortunately, there have been unbelievable strides made in the operation aspect of this hobby in just the last ten years, and I feel we are only now entering the truly Golden Age of railroad modeling.

Anyway, with train movements and traffic established on your railroad, it's time to make sure the yard(s) you built can support the rest of the layout and work smoothly. In the next installment, we delve into one yard design that I know works and makes good use of limited space.

LET US HEAR FROM YOU!

Got a question about any of the procedures and items in this series on traffic flow? Need a point clarified? Do you have additional information you'd like to elaborate on? Let us know! Write to John Swanson in care of PROTOTYPE MODELER, P.O. Box 379, Waukesha, WI 53187-0379. He'll endeavor to answer your question(s) and/or present your ideas and points in Company Mail or (if response warrants) in a special addendum to this three-part series on traffic flow. (Remember, there's really only one kind of "dumb" question—the one that goes unasked.)

Fig. 4/ Sample work messages

Work messages are given to each operator (train crew) along with the waybills (see previous installment of this series) when the crew is called to duty for their train assignment. Work messages are reused (unless you wish to restructure certain schedules or train functions) and thus should be typed (or printed) on sturdy paper stock.

DEFIANCE YARD
Throttle Y
NO 398 LIST 101PM
ENG: _____
MINE RUN
BALDWIN: NO WORK
GLEN CARBON: NO WORK
PRAIRIE GROVE: DO MINE SWITCHING;
ORIENT #3 MINE HAS STANDING ORDER
FOR 10 EMPTIES
ALMONT: DO WASHER SWITCHING; WASHER
HAS STANDING ORDER FOR 10 EMPTIES;
PLACE 5 EACH ON TRACKS 1 AND 2.
LINE UP OJ AND DEFIANCE YARD
LOADING FROM WASHER AND ORIENT #3
AND LEAVE IN HOPPER YARD; HANDLE
SHORT AND CLINTON LOADING TO EBNER
EBNER: YARD YOUR TRAIN; TAKE ENGINE
TO ENGINEHOUSE

DEFIANCE YARD
Throttle C
NO 370 LIST 1201AM
ENG: _____
THROUGH LOADING
PERISHABLE & MERCHANDISE TO
OJ YARD

EBNER SWITCHER
Local throttle
LIST 1201 AM
LINE UP LOADING FOR 393
CARBOOSE
BALDWIN
GLEN CARBON
PRAIRIE GROVE
ALMONT
LINE UP LOADING FOR 382
LYONS AND MIDWAY (to be set out at Midway
HALLS
WYANET
KINGS
CARBOOSE
LINE UP JVS&D LOADING AND CARBOOSE NORTH END
LINE UP LOADING FROM JVS&D
SWITCH EBNER PROPER
LINE UP MINE EMPTIES FOR 399 AND CARBOOSE
NORTH END
LINE UP LOADING FROM EBNER PROPER, 381,
394, AND 398
OJ AND NORTH LOADING IN ONE BLOCK
DEFIANCE LOADING IN ONE BLOCK
CLINTON LOADING IN ONE BLOCK ON HEAD END
OF DEFIANCE LOADING
MINE EMPTIES IN ONE BLOCK
SET SHORT CARS TO A STUB TRACK IN YARD

ILLUSTRATION: PROTOTYPE MODELER: Mark Danneman



Double-headed Ten-Wheelers ease into Midway with southbound tonnage. Double-headers on the Wyanet aren't done for fun or looks, but because a train's tonnage may demand such.