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**Railroader**

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Annual 2018

# Model Railroad Planning

## 2018

## 15 practical all-new planning stories

Tips on design, construction, and model railroad operation

**Lessons learned and put to use:**  
Narrow gauge layout full of innovations p.10

**7 things to avoid when planning a layout**  
p.90

Learn from  
Doug Tagsold's new  
Colorado & Southern Ry.  
See page 10.

**PLUS**

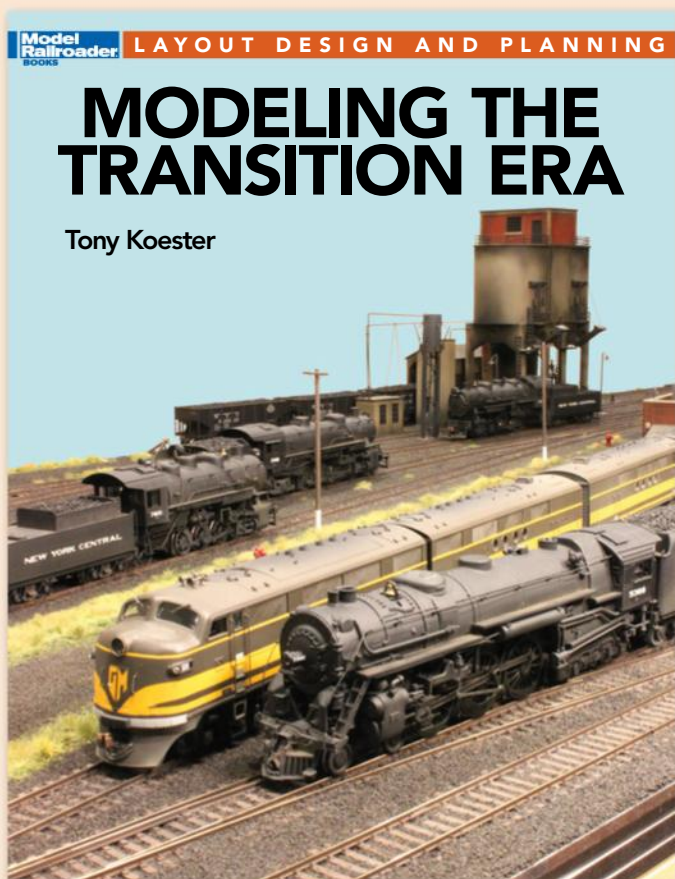
**Fitting a big industry in a small space** p.38

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**New  
Book**  
by Tony  
Koester

# Changing Times

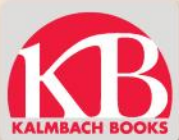


In his all-new book, *Modeling the Transition Era*, expert Tony Koester takes an in-depth look at the time period from the 1940s to 1950s — the most popular modeling era — when railroads were changing from steam locomotives to diesel. The book includes:

- An overview of the era: why diesel locomotives replaced steam, and how they each worked.
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- A look at typical railroad operations of the era and how they adapted from steam to diesel.

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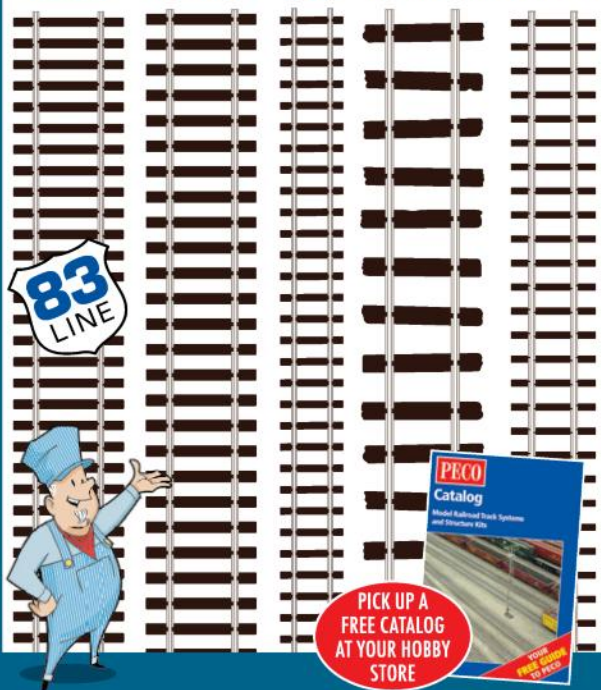
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## Editorial offices

Phone: 262-796-8776

E-mail: [mrmag@mrmag.com](mailto:mrmag@mrmag.com)

Web: [www.ModelRailroader.com](http://www.ModelRailroader.com)

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## Editorial

# Colorado's Rocky Mountain high

**Doug Tagsold is one** of the most prolific modelers I've ever met. When he sets his sights on a goal, he moves quickly toward it, even when the way is off the beaten path. He's modeled the Rio Grande's Moffat Road and the D&RGW-Santa Fe Joint Line west and south of Denver, converted the Joint Line to the industrial Denver Belt, built an On3 edition of one of the Rio Grande's slim gauge lines, and modeled the Toledo belt line scene not far from his Michigan home.

Now you can read about what he's doing today starting on page 10 ["Applying lessons learned"]. I won't spoil his narrative by giving away the details, but I'll admit that I fully understand what drove him back to Colorado. John Denver once sang about the "Rocky Mountain High" and coming home to a place he'd never been before. Colorado does that to many visitors.

During one trip, following a Narrow Gauge National Convention in Durango, Colo., my wife and I took a bus tour of the Rio Grande Southern's right-of-way and talked to a real estate agent in Telluride about a lot we saw for sale near Trout Lake's still-extant water tank. Never mind that we never vacation in the same place twice, or that it's probably under 10 feet of snow through June. We were under the spell of Colorado, and it seemed to make sense at the time.

Fortunately, the bus was leaving and we never got further than the talking stage. But I have no problem appreciating what John Denver sang about and why Doug once again chose to model Colorado railroading. Maybe if I still lived in Iowa or Indiana, the Rockies' siren song could reach far enough east from Denver's lofty climes to influence my modeling choices, as well.

## The other guy's scale and gauge

One of the benefits of being a magazine editor is that I read all of the articles. I always learn something of interest; in many cases, I'm inspired to follow the author's example or at least investigate his or her premise further.

Always? Yes, always. If I don't find anything of interest or value, a submitted article simply doesn't appear in these pages. I've been a scale model railroader and magazine editor for a long time, and it's my responsibility to ensure that everything we publish is worthy of the space we devote to it.

I would, therefore, be disappointed to learn that you read only those features about layouts like yours. So if you're in HO, as most of us are, please don't naively assume that an article about someone's N, S, O or G scale modeling endeavors won't be of interest. Do you model the Transition Era? Read the article about modeling a modern short line anyway [see below]. In many cases, the author will find a way to turn a phrase into something that, to our surprise, evokes a strong response.

End of lecture. This copy of *Model Railroad Planning* is all yours. The burden is now on you to derive the most value per page. Wring every last cent out of it! And let us know when we come up short.

## Ride what you read about

If you find Ron Griffin's article about the Adrian & Blissfield modern short line of interest ["Modeling a Michigan short line," page 58], you may want to consider a visit to the southeastern Michigan town of Blissfield. There you can ride and dine aboard the ADBR's popular Old Road Dinner Train. Visit [www.abrailroad.com](http://www.abrailroad.com) for more details.



It's seldom you can actually ride on a railroad featured in MRP. But that's precisely the case with the dinner train operated by the Adrian & Blissfield in southeastern Michigan. See Ron Griffin's report on page 58. Ron Griffin photo



If you read only those articles that pertain to a specific scale and gauge, you'll be a bit befuddled on how to approach Doug Tagsold's cover story on page 10 about modeling the Colorado & Southern in – well, there isn't even a letter to designate the scale he's chosen. The gauge is HO, but that's where conventional modeling nomenclature ends. Doug Tagsold photo

## Roadway animation

A demonstration at a recent National Model Railroad Association convention and train show caught my eye. Tomytec, a line of N scale rail and highway vehicles distributed in the U.S. by Wm. K. Walther Inc., had a small but highly animated "layout" featuring their World Bus Collection.

Several GMC model TDH-4512 buses made regular turns through a closed-loop pattern of streets assembled from a Tomytec kit, which included paved straight and curved sections as well as a wider section where the bus pulled over at a bus stop.

During my brief observation, everything ran smoothly, including the bus stops. I didn't see any intersections where the buses had to pause for stop signs or traffic lights.

Two thoughts immediately came to mind: If they can do this seamlessly in N, they or someone else can certainly do it in HO or a larger scale. And since I believe that creative animation is the next big thing in scale model railroad-ing, it's now clear that layout design has an exciting new challenge: To take advantage of such automated roadway

systems, we need to find creative ways to include street loops that allow continuous operation of road vehicles but don't look like loops.

The trolley and interurban crowd has a leg up on the rest of us, as they already have to think in similar terms of where the electrified cars enter city streets. No one points to their efforts as being toy-like or unrealistic, as that's the way things were; the prototype had the same needs we modelers do. (See "Adding traction to a steam railroad" by Tom Bailey in MRP 2017.)

But the scale modeling crowd, which for the most part is not enlightened about traction layout design, will have to swipe a few pages from the electrified street railroading design handbooks – and then extrapolate those ideas to accommodate continuous runs for road vehicles that don't resemble amusement park rides.

Erik Block and Evan Daes offered strong hints at the path forward in their MRP 2015 article, "Modeling New York City's 'High Line.'" Their track plan doesn't show the off-stage vehicle routes, but you can divine them pretty quickly once you see what they needed

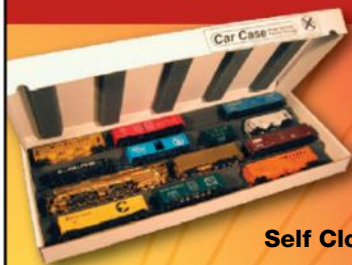


The Tomytec display at the NMRA's 2016 National Train Show in Indianapolis featured N scale GMC buses that steered their way around a loop of roadway and pulled off at bus stops along the route. Tony Koester photo

to do. Few of us are going to emulate their intricate conversion of stock vehicle chassis to accommodate animation, but innovative firms like Tomytec suggest that the need to do so is happily nearing an end.

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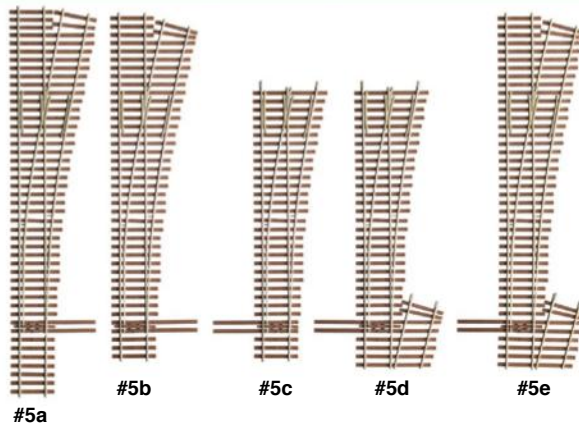


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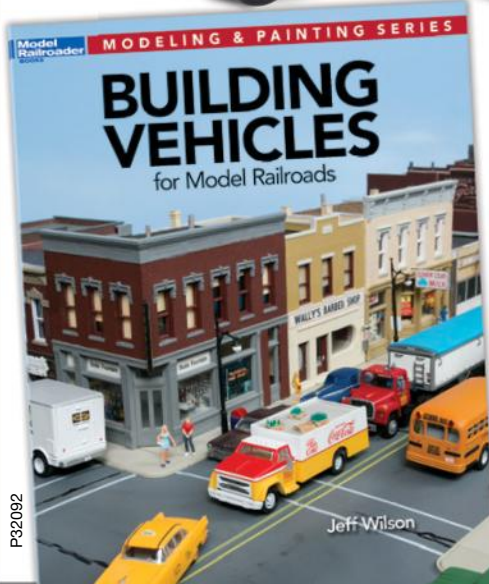
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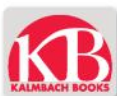
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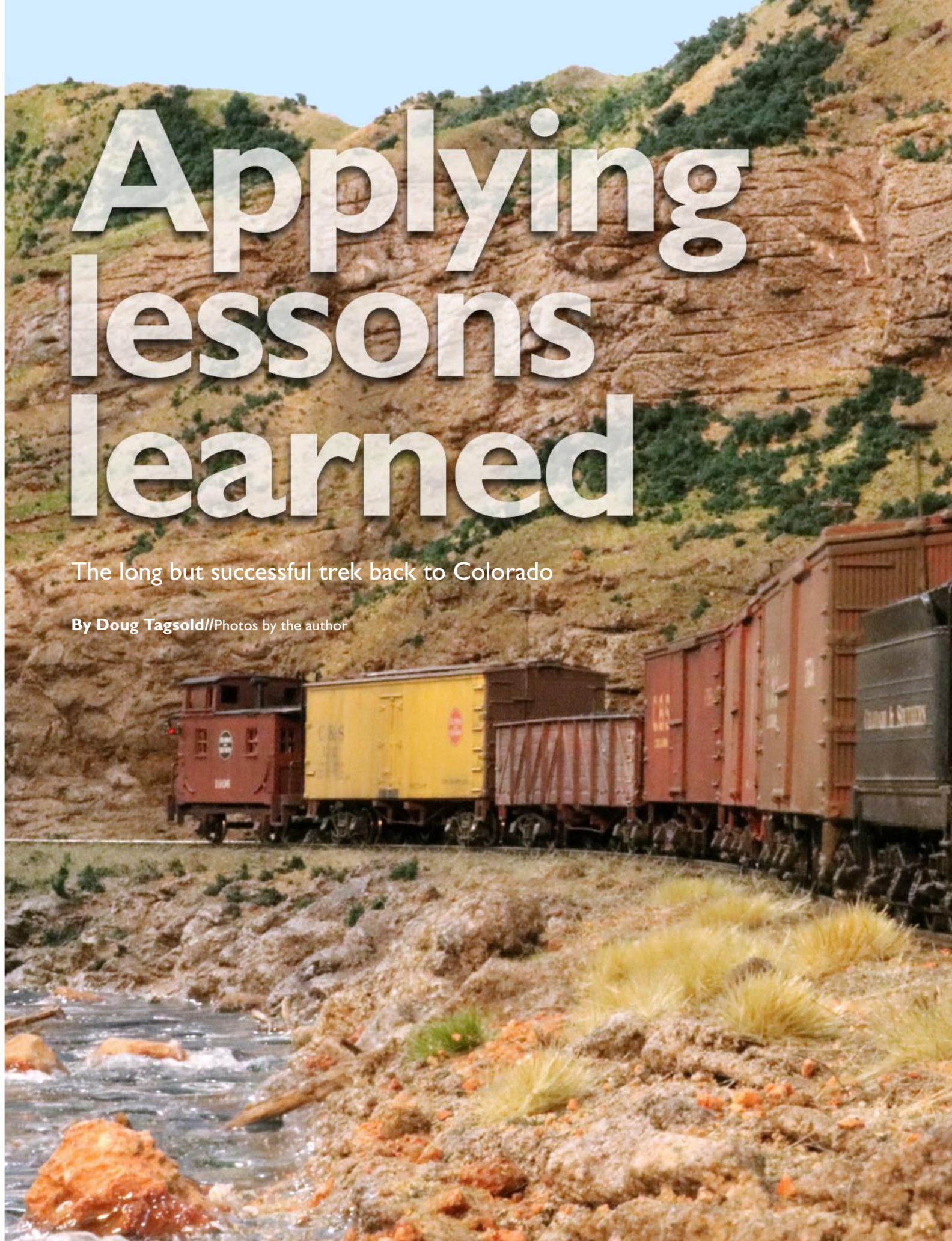
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# Applying lessons learned

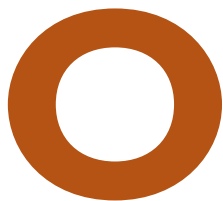
The long but successful trek back to Colorado

By Doug Tagsold//Photos by the author



**1** Colorado & Southern Extra 69 East makes its way downgrade through the towering rock cliffs of Clear Creek Canyon on Doug Tagsold's narrow gauge Colorado & Southern. There's nothing in the photo that reveals the actual scale of the models.





**Over the past six decades,** I've built numerous layouts, beginning with my grandfather's and father's

Lionel trains, then N scale, and then converting to HO. Each layout was a valuable learning experience as well as another step away from the first "loop of track" layout toward something that resembled a full-size railroad.

College was a place for learning, both for my future family business career and for my future model railroading endeavors. I think that what I learned from *Model Railroader* and *Railroad Model Craftsman* was just as important as the college courses. The late 1970s were when articles in MR by Jim Hediger about his Ohio Southern introduced the double-deck layout, and Allen McClelland's seminal *Virginian & Ohio* series appeared in RMC.

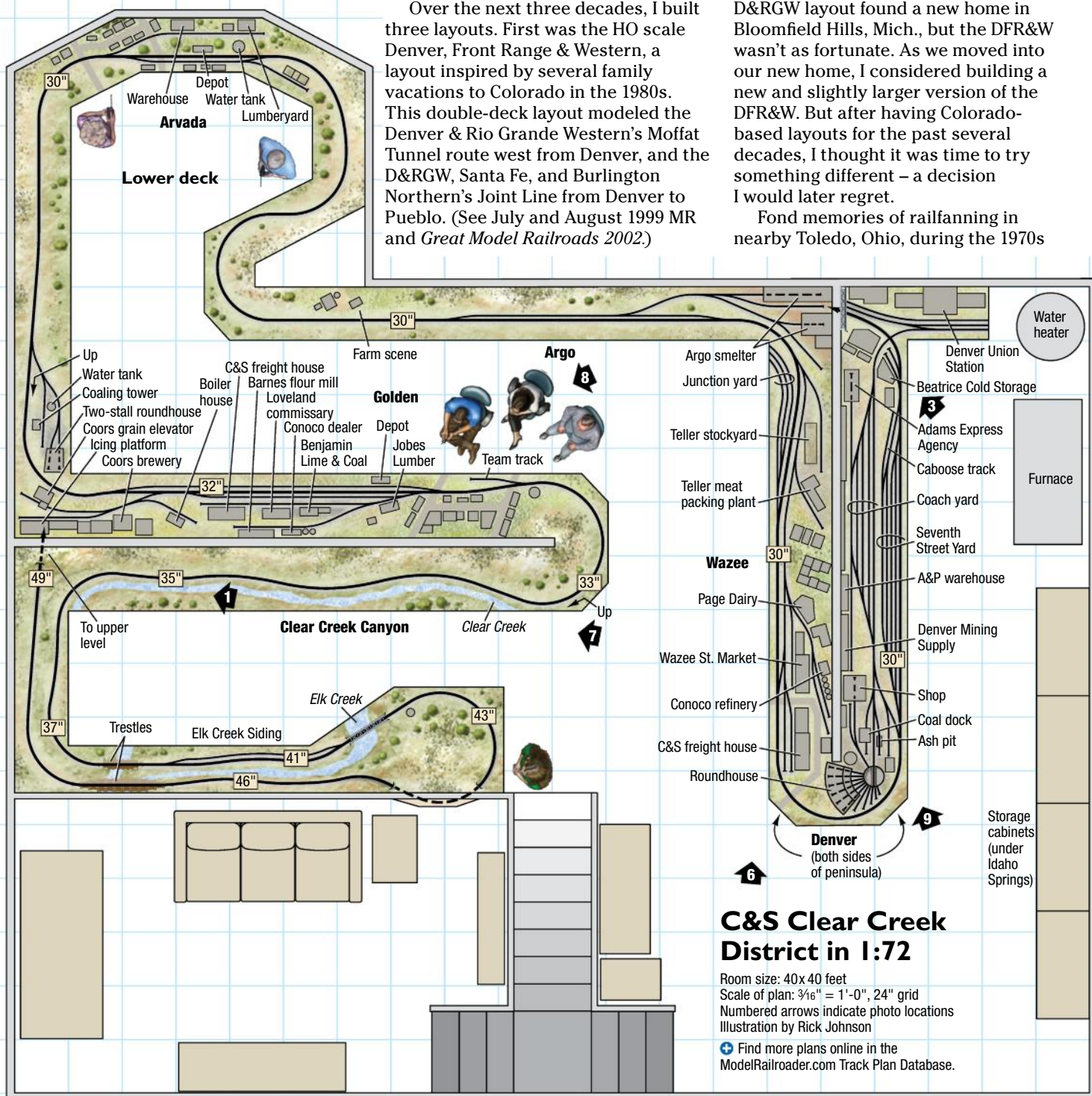
### Three decades, three layouts

Over the next three decades, I built three layouts. First was the HO scale Denver, Front Range & Western, a layout inspired by several family vacations to Colorado in the 1980s. This double-deck layout modeled the Denver & Rio Grande Western's Moffat Tunnel route west from Denver, and the D&RGW, Santa Fe, and Burlington Northern's Joint Line from Denver to Pueblo. (See July and August 1999 MR and *Great Model Railroads* 2002.)

During this layout's second decade of operation, the lower deck was rebuilt to include more of Denver's industrial switching (see *Model Railroad Planning* 2010). I also built a second layout, the D&RGW's Silverton Branch in On3 (see GMR 2007). This layout was built to continue my fondness for Colorado mountain scenery, and to have a layout with timetable and train-order operation.

The sale of our home and the family business in 2010 led to the dismantling of these two model railroads. The On3 D&RGW layout found a new home in Bloomfield Hills, Mich., but the DFR&W wasn't as fortunate. As we moved into our new home, I considered building a new and slightly larger version of the DFR&W. But after having Colorado-based layouts for the past several decades, I thought it was time to try something different – a decision I would later regret.

Fond memories of railfanning in nearby Toledo, Ohio, during the 1970s



pointed me in that direction. The new Terminal of Toledo depicted Conrail, Norfolk & Western, Chessie, and numerous other railroads that passed through and worked in Toledo at that time (see GMR 2010). This was basically a 1,200-square-foot industrial switching layout, built at a height of 40" from the floor, a compromise height determined from my experience on the DFR&W to be low enough to be worked from a chair and also high enough to be worked while standing. Crews sat in

office-style chairs on casters and rolled around the basement floor following their trains when operating on its lower deck. I continued that feature on the Toledo layout.

Although I continued to work and operate on the Toledo layout for five

years, by its second year I was beginning to miss modeling Colorado. Somewhat reluctantly, during the summer of 2014, motive power, rolling stock, and sections of the layout were sold off, and I began planning for another Colorado-based layout.

## The layout at a glance

**Name:** Colorado & Southern Clear Creek District

**Scale:** 1:72

**Size:** 30 x 40 feet

**Prototype:** C&S Clear Creek District

**Locale:** Denver west into the Rocky Mountains

**Period:** 1920s

**Style:** double-deck linear walkaround (roll-around)

**Mainline run:** 450 feet plus 150-foot branch line

**Minimum radius:** 24"

**Minimum turnout:** no.6

**Maximum grade:** 3 percent

**Train length:** 5 to 7 cars (4 to 6 feet)

**Benchwork:** open grid

**Height:** 30" to 70"

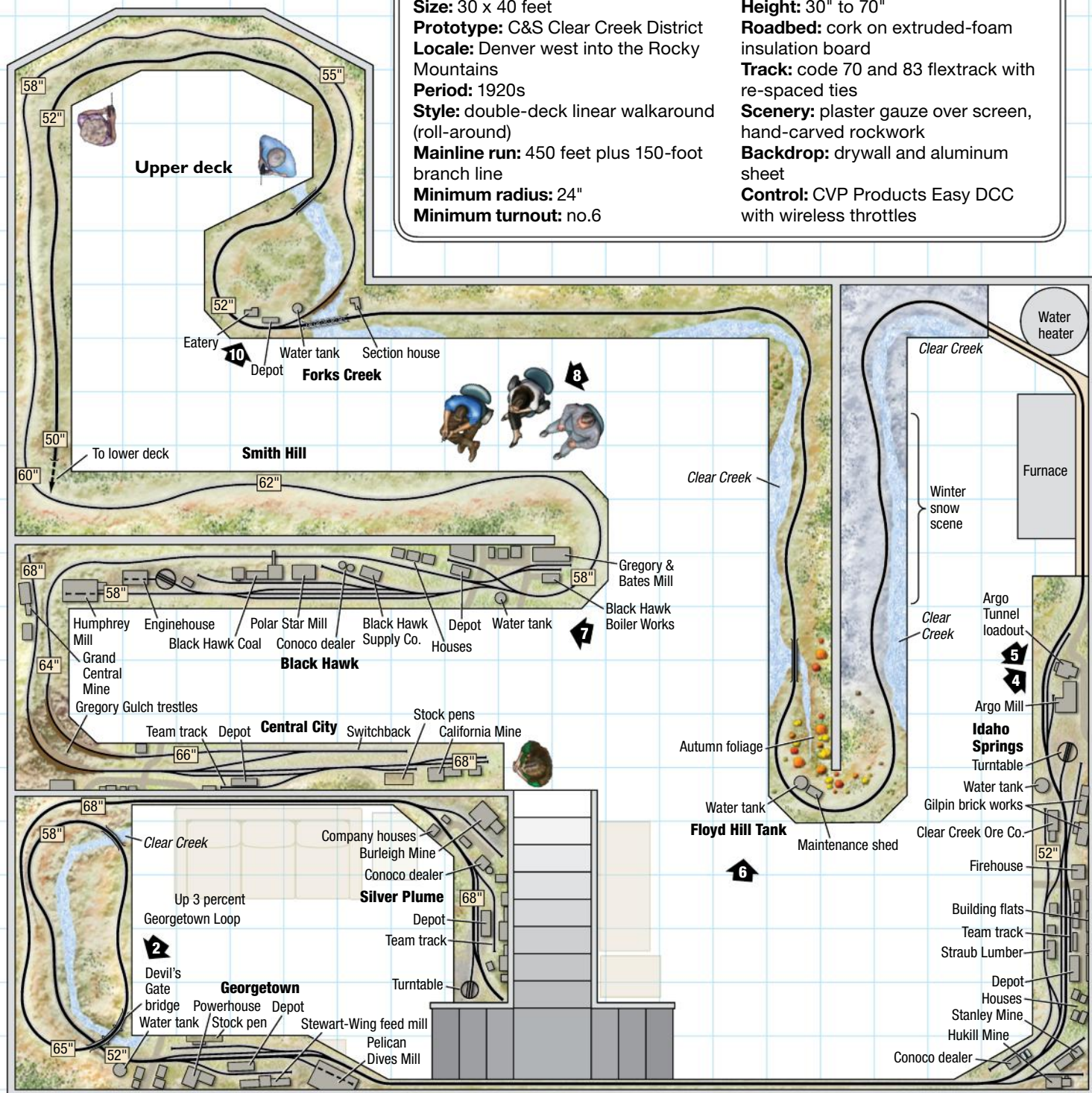
**Roadbed:** cork on extruded-foam insulation board

**Track:** code 70 and 83 flextrack with re-spaced ties

**Scenery:** plaster gauze over screen, hand-carved rockwork

**Backdrop:** drywall and aluminum sheet

**Control:** CVP Products Easy DCC with wireless throttles





double-deck layout would again be the best option.

The actual distance traveled isn't the only factor that can make running a train feel like it's making a long run. First is train speed: A 1,000-foot-long mainline run will only take a train a few minutes to traverse if it's moving along at speeds in excess of 60 scale mph, whereas a train waddling along at 15 to 25 mph will take much longer. A longer time feels like a longer distance.

Running shorter trains can also make a main line seem longer than it really is. Two towns on a layout spaced 30 feet apart are separated by only one train length if you're modeling a modern mainline railroad with trains made up of several locomotives and 25 to 30 cars. When you're operating a shorter train with only one engine and 5 to 10 cars, this same distance will seem comparatively longer.

Keeping these concepts in mind, I chose to maximize the length of the main line with long distances between towns or passing sidings, short trains, and slow-speed operation.

### Finding a prototype to model

To get as much opportunity for switching operations into the layout as possible, I decided that the layout should either originate or pass through a fairly large urban area. The best place for this would most likely be on the lower deck, where operators could be seated. Much of the rural (mountain) running would be on the upper deck, with smaller towns each having their own switching opportunities.

**2** Two C&S trains head downgrade around the famous Georgetown Loop: Extra 70 East crossing over the Devil's Gate bridge and passenger train No. 52 led by engine no. 10 passing beneath. Doug built this portion of the layout as a 4½ x 9-foot freestanding island, then moved it into its final position.

### Modeling the C&S

Now was the time to put everything I'd learned from my previous layouts into a design that would keep me satisfied for many years. I made a list of requirements for my next layout:

- Colorado scenery
- Timetable and train-order (TT&TO) operation
- Long mainline run
- Lots of switching opportunities
- Lower-deck operation from chairs
- Extensive use of photo backdrops
- Spacious aisles

The decision to model Colorado scenery again was paramount. Even

with the newer methods of forming mountain scenery from foam castings or silicone molds, I still enjoy hand-carving the rockwork on my layouts from plaster. It can be time consuming, but a layout with lots of that kind of scenery could keep me happily occupied for many years.

Some of the remaining items on my list of layout requirements seem to contradict each other, but with some good planning, they don't have to.

Most would agree that it's usually beneficial to have a fairly long mainline run to get good TT&TO operation. For that reason I decided that building a



**3** Beatrice Cold Storage in Denver is the destination for much of the beer the C&S picks up from the Coors brewery in Golden. Here engine no. 5 picks up an empty reefer to take back to Seventh Street Yard, where it will be placed into the next train to Golden.

I wanted the layout to be based on a prototype, so I started researching the railroads of Colorado. The requirement for short trains and slow speeds sounded a lot like a narrow-gauge railroad. However, one usually thinks of a Colorado narrow-gauge railroad as hosting but one or two trains a day (or week), which wouldn't lend itself to multi-crew operating sessions with enough traffic to reap the challenge and enjoyment of TT&TO operation.

I then rediscovered the Colorado & Southern's Clear Creek line running from Denver to Golden, Colo., then into the mountain mining towns of Black Hawk, Central City, Idaho Springs, Georgetown, and over the Georgetown Loop to Silver Plume. This 56-mile narrow-gauge line was built in the late 1870s as the Colorado Central RR, Colorado's first 3-foot-gauge railroad. This is the same line that Harry Brunk made famous in HOn3 (see MRP 2002 and numerous articles in *Narrow Gauge & Short Line Gazette*).

According to a C&S timetable from 1912, this line had three scheduled first-class daily passenger trains in each direction, as well as three scheduled second-class freights in both directions daily except Sunday. Most likely there were also extra trains that ran fairly regularly.

## Selecting a scale



Doug considered 1:87 HOn3 models (top row, courtesy of Dex Decker) and 1:64 brass Sn3 models (bottom row, courtesy of Dan Kempf). The middle row shows the 1:72 models Doug kitbashed from HO standard-gauge models to achieve a narrow-gauge look. The engine and boxcar are Athearn/Roundhouse models; the caboose is a Bachmann bobber with the cupola moved to the end of the caboose.

**Up to this point**, I've not mentioned what scale this new layout is. In fact, early in the planning, I wasn't sure what it would be. I purchased an HOn3 Blackstone locomotive and several pieces of rolling stock. The Blackstone (made by SoundTraxx) locomotives run as well as locomotives in any scale, and are reasonably priced. P-B-L makes equally great looking and running motive power and rolling stock in Sn3, albeit at considerably higher prices.

During this time of indecision, I found on eBay an HO standard gauge 2-8-0 that visually looked very similar to a narrow gauge Consolidation: Athearn's ready-to-run Old Timer 2-8-0. The former MDC/Roundhouse model has been upgraded with a precision motor and flywheel, and with electrical pickup on all drivers and tender wheels.

Further searching found several of these models at reasonable prices. I purchased one with DCC sound and found that it ran quite well. Power pickup was very good for such a small locomotive, running through turnouts with dead frogs with no problems. I installed a Tsunami sound decoder and some detail parts, including the C&S's distinctive "bear trap" spark arrestor, to see if this engine could be made to represent a C&S narrow gauge locomotive.

Painted and lettered for the C&S, and with a slightly enlarged cab, the engine looked quite good sitting on standard HO track. But what scale did this locomotive now represent? I compared the finished locomotive to an HOn3 C-16 model, and to an Sn3 model, and found it to be right in between. It turned out to be about a 1:72 scale model of a narrow gauge C-16 locomotive.

Modeling in 1:72 is popular among military modelers, so finding vintage automobiles and figures wouldn't be a problem. But what about rolling stock? I again looked at Athearn's HO scale Roundhouse line and bought a 36-foot wood boxcar. An HO scale 36-foot boxcar scales out to 30 feet in 1:72, the exact length of most narrow gauge boxcars! And their 60-foot Overland passenger cars are close matches to narrow gauge equipment in 1:72.

The remaining issue I had to contend with was the track gauge. In 1:72, HO scale track is 3.9 feet in gauge, not the 3-foot gauge of the C&S prototype. Yes, it would still be narrow gauge, just not 3-foot narrow gauge. Was that something I could live with? Bottom line: Yes!

Narrowing the wheels on the axles and handlaying the track would be an option, but the thought of handlaying more than 1,000 feet of track and building more than 150 turnouts was of no interest. I experimented with HO track, spacing out the ties to give the track a narrow-gauge look. Not bad!

For structures, many HO scale buildings are being used as-is in the background. Others had slightly larger doors added. Several new structures have been scratchbuilt to 1:72 scale, with many more to come.

Most visitors won't notice the difference of this scale. To them, the C&S is simply an HO standard gauge layout with a narrow gauge feel. – Doug Tagsold



**4** Engine no. 72 picks up four low-grade ore loads at the Argo Tunnel load-out at Idaho Springs. Low-grade ore was often shipped in gondolas, while high-grade ore was

shipped in boxcars. Doug built this 4-foot section as an experiment before the layout was even started to be sure he was satisfied with this landmark structure.

I learned that it wasn't until the introduction of the automobile and the building of decent roads into the mountains in the 1930s that traffic on this line dwindled to a single train a day, leading to complete abandonment in 1941. Into the 1920s, the people in these remote towns still relied on the railroad for almost all of their transportation needs. Besides carrying local passengers and tourists, the railroad also delivered food and clothing, mining supplies, lumber, coal, and gasoline to these mountain mining towns. The C&S also hauled various low- and high-grade ores, primarily gold and silver, out of the mountains to the smelters in Denver.

Since I'd already researched and built one narrow-gauge railroad layout, I was familiar with many of Colorado's

narrow-gauge railroads. I liked their somewhat smaller locomotives (as long as the models ran well) and the smaller rolling stock. These trains ran through the beautiful mountain scenery that I wanted to build. But it was the amount of regular traffic on the Colorado & Southern's Clear Creek line that really grabbed my attention.

### Reusing existing benchwork

After ascertaining that there were good-running models of small steam motive power and rolling stock available, I decided to base my next layout on the Colorado & Southern's Clear Creek line in the early 1920s. [See "Selecting a scale" on the previous page. – Ed.]

I then drew a track plan for the 1,200-square-foot basement. The footprint very much resembled that of my Toledo layout. In fact, most of the freestanding interior walls and benchwork from the Toledo layout were reused simply by lowering the benchwork and adding a deck above it.

I wanted crew members to be able to operate from chairs again. Extra aisle width is required for two opera-

tors in chairs to be able to pass each other, so aisles were left especially wide, ranging from 48" to 60".

Based on what I'd learned on the DFR&W, having 20" of deck separation (from railhead to railhead) worked well. Subtracting the necessary 3" to 4" for the thickness of the upper-deck benchwork still left a minimum of 16" of open space between decks.

The track heights of 37" and 57" on the DFR&W worked well, but I experimented with that a bit. Noticing that the standard computer desk or kitchen table is only 30" tall, I reduced the lower deck's elevation to that height. But if the upper deck was built 20" higher, at 50", would I be able to roll around in a chair while running a train on the upper deck?

For the 40" high Toledo layout – a compromise height that allowed operating while either seated or standing – I'd acquired a half-dozen drafting chairs. These chairs are adjustable, ranging from normal chair height up to barstool height. With the C&S's upper deck track at 50" to 52", I found I could sit on a raised drafting chair and view the trains running on

### On our website

You can read Doug's article on his On3 Silverton Branch layout from *Great Model Railroads 2007*. Click on the link under Online Extras at [www.ModelRailroader.com](http://www.ModelRailroader.com).

## Learning points

- Colorado remains a modeling magnet.
- Inspiration may assume many forms; finding an appealing locomotive could lead you in an entirely new direction.
- Good-running locomotives are a primary requirement for enjoyable operation.
- If your current layout is losing its appeal, perhaps its “bones” can be used to create something more appealing.
- A compromise in modeling exactly to scale led to the creation of an entirely new scale for model railroading – 1:72 – that’s supported by military modeling suppliers.
- By using or modifying readily available models and track, a layout can be fully operational in a relatively short time.

the upper deck at shoulder level; I still had my feet on the floor and was able to propel myself around the basement and follow my train. Though I do need to stand while switching the upper deck, I can remain seated while running from town to town, enjoying the realistic low-angle view.

Denver and Golden were therefore set at a height of 30". Both of these urban industrial areas provide plenty of local switching, enough that each location has a crew assigned to perform that work for the entire operating session. West of Golden, rather than using a helix to gain the elevation to reach the upper deck, the main line remains in the open as it travels up Clear Creek Canyon on a constant 2 percent grade. After passing the water tank and short passing siding at Elk Creek and doubling back in direction, the main line finally punches through the backdrop behind and above Golden, emerging on the upper deck at 50".

Continuing west, the main line reaches the depot and junction at Forks Creek at an elevation of 52". Here the main line splits, with one line running to Black Hawk and Central City, while the other continues on to Idaho Springs, Georgetown, and Silver Plume, just as on the prototype.

The line to Black Hawk continues to climb at 2 percent as it continues on to Black Hawk and Central City. These towns are located above the portion of the lower deck where the main line is



**5** C&S engine no. 5 pulls a short freight out of Idaho Springs on its way to Denver. Doug made this 2-6-0 engine by shortening the frame and removing the second driver of an Athearn/Roundhouse 2-8-0 locomotive.



**6** The 30" and 50" deck heights allow crews to operate while seated in adjustable-height rolling chairs while operating on either deck of the layout. Here, Dale Pape runs passenger train No. 51 on the upper deck, while Dex Decker brings his local freight into Denver below.

climbing toward the upper deck. To maintain the 20" difference between the two decks, I raised Black Hawk to 60" and Central City to 70".

A 10" tall, 24" wide elevated platform runs along the Central City side of the aisle for operators to stand on while working there. A 3 percent grade and a switchback are required to climb from Black Hawk to Central City. This is exactly what the prototype railroad had to do!

Going back to Forks Creek, the other branch continues to run level at 52" on

to Idaho Springs and Georgetown. West of Georgetown, the branch again climbs, this time around the famed Georgetown Loop to reach the end of the line at Silver Plume, 64" above the floor. Here there is a 6" high operators platform to stand on to assist the more vertically challenged operators.

With the relatively small number of towns served by the railroad, a mainline run of 450 feet from Denver to Silver Plume, and another 150 feet on the Central City branch, the layout averages about 75 feet between towns



**7** Black Hawk is on the upper deck above Clear Creek Canyon. Where there is a town on one deck where a crew could be working, the other deck has the main line running through mountain scenery where no switching is required.



**8** Golden on the lower deck is a busy place, with the railroad's largest shipper, the Coors brewery, along with many smaller businesses. Doug leaves towns mocked up for a while before deciding where each structure will go.

and/or passing sidings. With the slow speed of the trains (25 scale mph max) and the short train lengths (5 to 7 cars for one engine), the distances seem quite long. Operators really need to think about what they're doing and double-check the timetable before

venturing out on the main line toward the next town, which is what makes TT&TO operations so rewarding.

### Layout construction

With the head start gained by reusing some of my existing benchwork

in an already finished basement, layout construction proceeded quickly. The use of Woodland Scenics foam risers for the subroadbed also sped up the progress. I find this riser system, which many veteran modelers scorn as being only for beginners building a "train set," to be useful for any modeler building a layout with a foam base.

A year after I started construction, the layout was operational, and monthly operating sessions began. I wanted to be certain the railroad would meet my operational goals before putting any more effort into additional construction or scenery work that might have to get torn out or redone later.

Now, several years later, I've been working on scenery in several areas. The more urban areas of Denver and Golden have been populated with structures, some of which were saved from the previous layouts, as well as several new ones.

I've continued to use photos for backdrops on the lower deck behind Denver and Golden to provide the appearance of more depth, but my plan for the upper deck is to use photo backdrops only behind towns where



**9** The C&S's main yard and engine facilities are at Seventh Street Yard in Denver, where the stable of 2-6-0 and 2-8-0 locomotives is readied for each day's work. The 60-foot turntable is a modified Walther's N scale 130-foot turntable.

space is limited. The majority of the layout will have mountain scenery with hand-carved rock work, providing me with years of satisfying modeling to look forward to.

I'm pleased with the layout operationally, as well. With the greater distance between the towns, shorter trains, and the slow-speed operation, the fun and challenge of timetable-and-train-order operation is working out very well.

I also like the variety of the complexity of the different jobs. For those who like lots of switching, the city jobs at Denver and Golden will keep them busy for the entire session. The three or four local freights also have a sizable amount of switching to do at each of the towns that they work. Running passenger trains on a schedule will fulfill the desires of operators looking for a relaxing evening without switching challenges.

We usually run the railroad with as many as eight train crews, plus a dispatcher. When fewer operators are available, we can run with as few as four or five people. During those times, the dispatcher job is eliminated, and no extra trains are run. The first-class



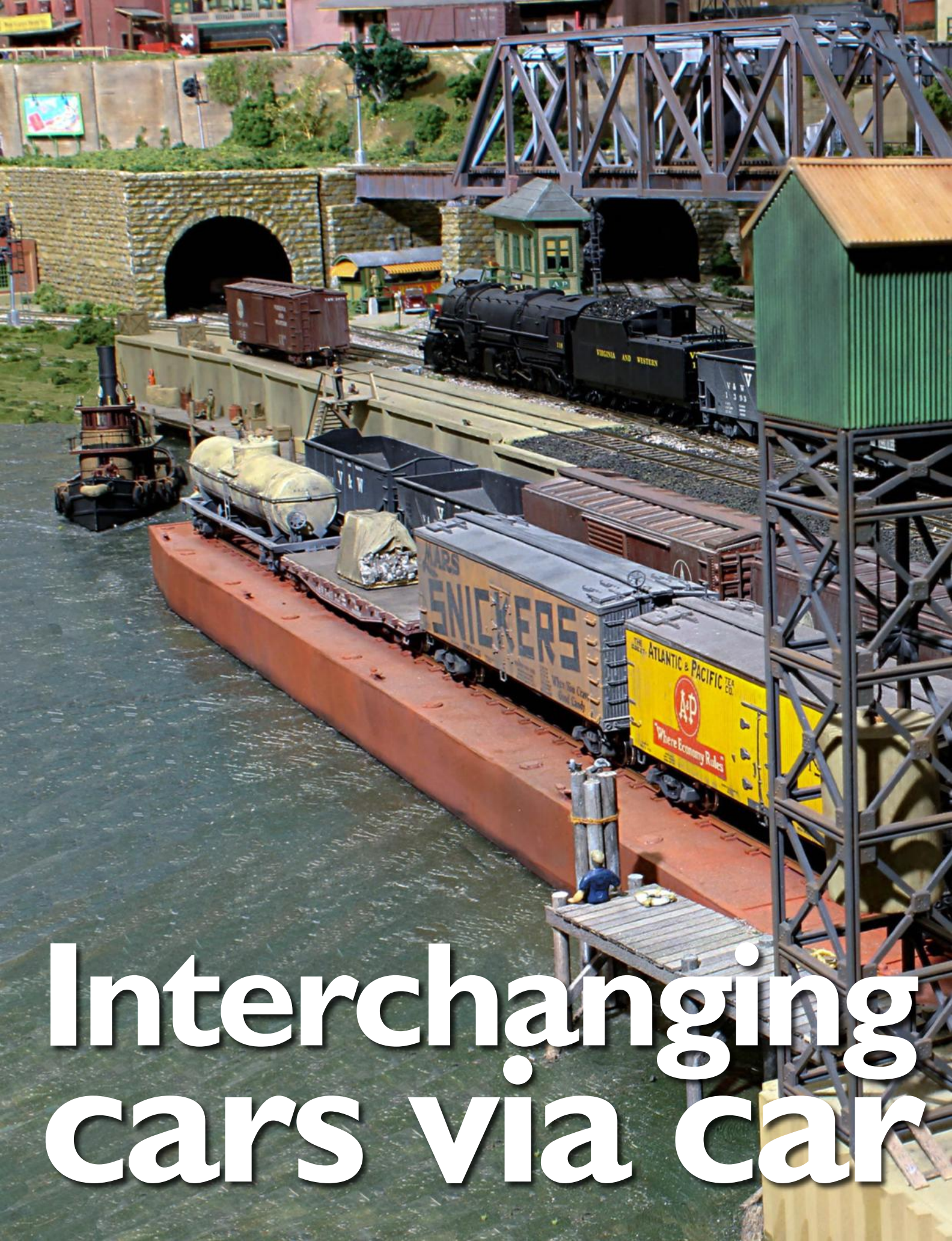
**10** The main line from Denver splits at Forks Creek, with one line going to Black Hawk and Central City, the other over the Georgetown Loop to Silver Plume. Before scenery is begun, Doug mocks up the mountains with bead board.

passenger trains and the second-class freights run by the timetable only.

I've taken what I've learned and liked most from all of my previous model railroads and have incorporated it into one new layout that's now providing endless hours of enjoyment,

which is what model railroading is all about. **MRP**

*Doug Tagsold lives in Blissfield, Mich., with his wife, Diane. His layouts have provided MR, GMR, and MRP readers with countless modeling ideas.*



Interchanging  
cars via car



# floats

Use the harbor to simulate cars moving on and off the railroad

**By Doug Kirkpatrick**

Photos by the author except where noted

Over the years, I've collected a variety of highly detailed rolling stock for my Virginia & Western RR (see "It's done with mirrors" in *Model Railroad Planning* 2017) with little consideration for the type of car. But after I was introduced to realistic operation, I realized I had far too many tank cars, refrigerator cars, and in particular anachronistic billboard reefers for an East Coast railroad set in the 1950s.

With few places to spot them on the railroad, I would move them from one end of staging to the other and back again, or simply remove them from the railroad by hand. Surely there was a more creative way to use some members of my freight car fleet.

## **Serving un-modeled industries**

It finally dawned on me that a car float provides an excellent place to spot cars that serve industries that are either under-represented or nonexistent on the railroad. The assumption is the industries needing the cars are across the harbor, river, or lake. A car float or ferry could also serve as a connection between two or more railroads. A car float thus creates a job for a local port crew.

That led me to modeling the port facilities needed to serve a car float or ferry. Walthers offers excellent three-track car float and car float apron kits. The bridge apron is attached on the land side with a hinge and allowed to rise and fall to account for the change in tides or river water levels.

The three-track float was too wide for my application, so I fabricated a two-track float from a 1 x 6 pine board wrapped in thin sheets of styrene. (With sufficient sanding and several coats of sealer and paint, the float can

Using "reach" cars across the apron, the daily port crew begins the process of unloading the car float for the morning local. It will deliver the cars to industries on Doug Kirkpatrick's Virginia & Western RR. A railroad-owned tugboat slowly maneuvers away from the float.



Mat Thompson uses continuous rail across the apron and onto float to eliminate possible derailments. He painted, thus insulating, the top surfaces of the apron and float rails to require the operator to switch the float using idler cars with the locomotive still on land. Mat Thompson photo

represent metal without the work of installing the styrene.) Sea Port Model Works ([www.seaportmodelworks.com](http://www.seaportmodelworks.com)) was my source for all of the fittings required for the float.

I didn't provide electrical power to the car float or apron. A set of reach or idler cars is used to service the float. I posted rules for loading and unload-

ing the float to maintain balance so the float will remain on a relatively even keel. The operator needs to know which cars are empty and which cars are loaded.

The float isn't removed to simulate its departure, as that creates the possibility of dropping cars on the floor. During a break in operations, a few cars may disappear while others appear on the float. My car float holds eight cars, and now my tank and refrigerator cars have a place to go.

### Other car floats

My friend Mat Thompson modified the Walthers float and apron to fit the Port of Astoria on his Oregon Coast RR. The Walthers apron transitions two tracks into a turnout that ends on the float, so the float has three tracks. Mat located the turnouts on shore and ran three tracks across a shortened apron. He also shortened the float, building it with only three of the four available sections, eliminating the section with the turnout track.

Like mine, Mat's float is permanently attached to the layout. Operating sessions start at high tide, meaning the float has just arrived. The Astoria yard crew unloads the float and later loads it for an outbound sailing per the loading guide instructions. His float holds a dozen 40-foot cars.

*Model Railroad Planning* author Paul Dolkos also employs a car float on his Baltimore Harbor District layout. The waterfront operations were featured in the December 2015 and January 2016 issues of *Model Railroader*. Paul scratchbuilt a replica of a two-track Western Maryland car float with its unusual curved tracks.

Paul powered both the apron and car float, as the Western Maryland allowed a small 44-ton diesel to move onto the float. This allows the WM to get motive power to a joint switching area without having to run over Baltimore & Ohio tracks. **MRP**

*This is Doug Kirkpatrick's second feature article in MRP.*

## Learning points

- A car float can remain stationary during an operating session.
- It can theoretically serve unmodeled industries or connections with other railroads.
- Cars must be loaded and unloaded according to specific rules to avoid unbalancing the float.
- Some railroads carried switch engines on their floats or car ferries to switch at the other end of their runs.

The tug is just about to tie up to the float as the crew secures the remaining cars on Mat's HO railroad. The third track adds an additional four 40-foot cars and greater loading and unloading flexibility. Mat Thompson photo



# BELLEVUE



An N scale tribute to a busy Midwestern hub in 1957

By John Colombo//Photos by the author

**A**s a professor at the University of Illinois, I'm fond of telling students that you can't plan your life. A great example of this is how I came to build an N scale layout inspired by the Nickel Plate Road in northern Ohio in 1957.

I didn't grow up anywhere near the NKP. As a child, I lived across the street from an Illinois Central branch line in southern Illinois. As far back as I can remember, I was fascinated by

trains. In grade school, I did a little HO scale modeling of the Illinois Central but lost interest during high school.

Then in 1990, after graduating from law school, working at a law firm in Georgia for several years, and then returning to Champaign, Ill., as a professor, I decided to return to the hobby. One of my students introduced me to her husband, who was a member of the local Ntrak club, the Midwest Central Railroad Club. The long trains and amount of layout possible in a small space with N scale was a big

draw for me, so I joined the club and built a module for the club layout.

Needing some N scale equipment to run on that layout, I asked club members what to buy, and they unanimously recommended that I start with an engine from Kato and rolling stock from Micro-Trains.

So one day I drove to a hobby shop in Indianapolis that had a good stock of N scale equipment. While browsing the shelves, I came across a diesel hood unit lettered for the NICKEL PLATE ROAD and with the barely visible letters

# REBORN



**I** The Nickel Plate's engine terminal at Bellevue, Ohio, boasted a concrete roundhouse and towering coal dock, both modeled on John Colombo's N scale layout. In 1957, steam and diesel power coexisted on the railroad.

N.Y.C.&ST.L. on the side. I'd never heard of the Nickel Plate, and based upon the initials on the hood, I thought the railroad must have been a subsidiary of the New York Central. But the engine was made by Kato (I later learned it was an Alco RSD-12 made by Kato for Atlas), and it was on sale. So I bought it along with a few boxcars.

After arriving home, I showed my new acquisitions to my wife, Tina. When she saw the engine, she remarked that she recalled engines lettered Nickel Plate Road in her hometown of Neoga, Ill. I was sure she was wrong; Neoga was on the main line of the Illinois Central, the only railroad I thought was associated with the town. But her dad confirmed that the

Nickel Plate had indeed run through Neoga and told stories of the "huge steam locomotives" that blew through town spewing cinders everywhere.

Intrigued by all this, I went to the university library looking for any material on the New York, Chicago & St. Louis RR, better known as the Nickel Plate. The library had a copy of John Rehor's *The Nickel Plate Story*, which I read cover-to-cover. It confirmed that the NKP did run through Neoga on its Clover Leaf line that it had purchased in the early 1920s. The book hooked me on the Nickel Plate.

I joined the Nickel Plate Historical & Technical Society ([www.nkphts.org](http://www.nkphts.org)) to take advantage of the wealth of information amassed by that organiza-

tion, and to get its quarterly full-color *Nickel Plate Road Magazine*. A couple of Green Frog videos of the NKP's Berkshires heading freight trains in the 1950s cemented the love affair, and I decided to build an NKP-based layout.

## The layout

My current layout is my third effort. In the early 1990s, after buying and reading John Armstrong's classic book, *Track Planning for Realistic Operation* (Kalmbach Publishing Co., 1998), I built a layout similar to the current one but set in 1964, just prior to the NKP's merger into the Norfolk & Western. This time frame allowed me to take advantage of the latest N scale diesels from Atlas and Kato.



**2** The steel viaduct at Rocky River just west of Cleveland was a favorite haunt of photographers. John's condensed version still captures the majesty of the prototype.



**3** The Nickel Plate's famous "High Speed Service" slogan was emblazoned on its wood and steel cabooses. John had N scale models of the 1000-series wood center-cupola cabooses 3-D printed by Shapeways.

I learned a great deal from this project, including early adoption of Digital Command Control (DCC), but I never came close to finishing the layout. I realized that the aisles were too narrow for operators to comfortably move around, and the layout lacked a consistent theme. It included parts of both the NKP's Chicago-to-Buffalo main line and the Clover Leaf around my wife's home town of Neoga.

Over time, my enthusiasm for this layout waned, and when our two sons grew into their teens, my wife and I cleared out the unfinished basement where the layout was, finished it into separate rooms, and made the larger of the rooms into a home theater. To keep my hand in the hobby, I built a smaller second layout around the walls of a spare bedroom. This one got close to "finished" in the sense of the entire layout having at least basic scenery.

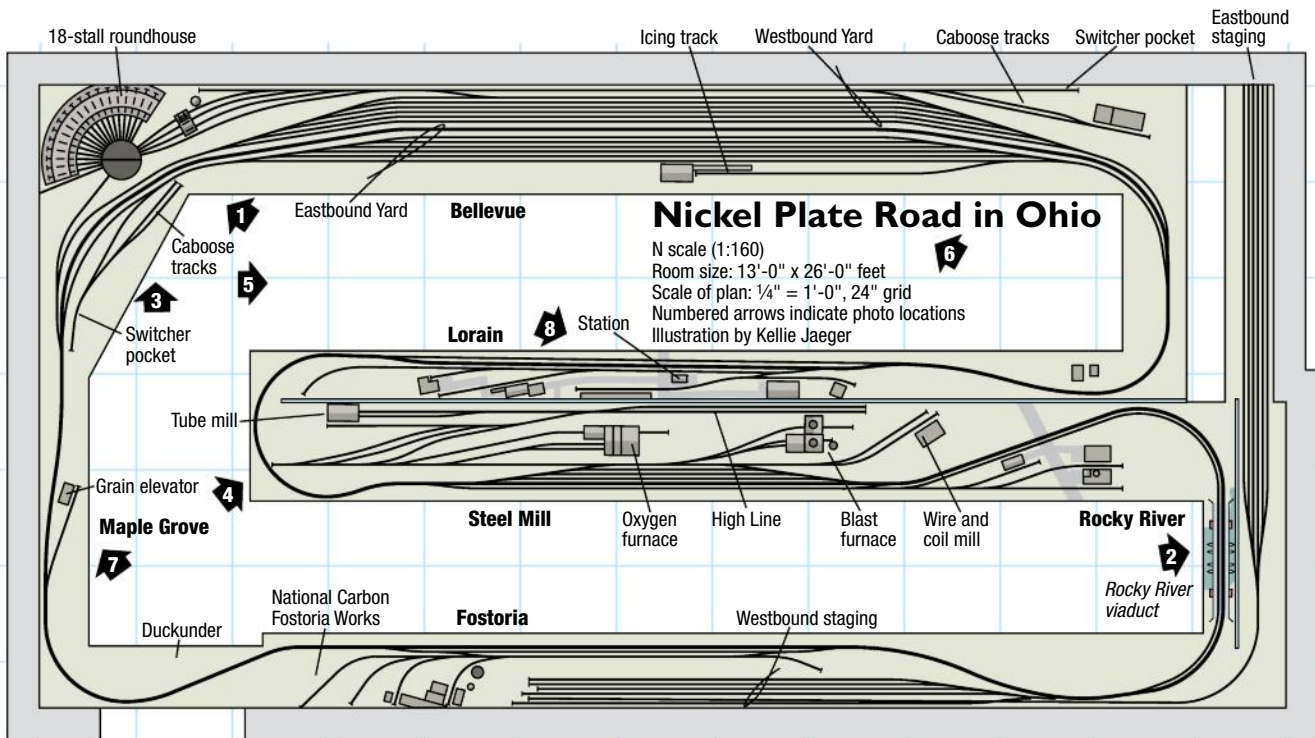
Nevertheless, the thought of a larger layout that "fixed" the major errors of my first one was always in my mind. So when the kids went off to college, I reclaimed the large (now finished) basement room for the current layout.

#### **A "look-and-feel" approach**

In the time between tearing down my first layout and starting this one, Life-Like (now Walthers) had released its Berkshire, and Kato had released its United States Railroad Administration (USRA) heavy Mikado, including an NKP version. I wanted to model both a



**4** The steel mill at Lorain, Ohio, is freelanced but reflects the heavy industry that borders the shores of Lake Erie in northern Ohio. John built it from Walthers kits with help from Midwest Central RR Club members.



**5** This view down one aisle with Bellevue on the left shows how John has applied a schematic of the tracks on the fascia to aid crews in locating track names and switch motor toggles. Note the overhead track lighting.

time period and a section of the railroad that would let me legitimately run Berks and Mikes alongside first-generation hood units from General Motors Electro-Motive Division and Alco. That meant the Chicago-to-Buffalo main line in 1957 – the last full year of regular mainline steam operations on the NKP.

I also realized that I wasn't interested in re-creating historically accurate towns; doing scenery and scratchbuilding structures aren't my favorite parts of model railroading. While learning the history of places

like Fostoria and Lorain would have been fun, I knew that actually building historically accurate models for these towns would just never get done.

Instead, I adopted a "look-and-feel" approach: I used prototypically accurate motive power and modeled a few "iconic" NKP structures, but freelanced the rest.

One of those iconic structures I already had: an accurate rendition of the NKP roundhouse at Bellevue, Ohio, mostly scratchbuilt for my first layout by Steve Hankel, one of the Midwest Central club members. I also had a

## The layout at a glance

**Name:** Nickel Plate Road in Ohio  
**Scale:** N (1:160)  
**Size:** 13 x 26 feet  
**Prototype:** Nickel Plate Road  
**Locale:** northwestern Ohio  
**Era:** 1957  
**Style:** walk-in  
**Mainline run:** 110 feet  
**Minimum radius:** 15"  
**Minimum turnout:** no. 7 (main line and yards), no. 4 (industries)  
**Maximum grade:** none  
**Train length:** 8 feet  
**Benchwork:** L-girder  
**Height:** 54"  
**Roadbed:** plywood  
**Track:** code 55 flextrack  
**Scenery:** Woodland Scenics ground foam  
**Backdrop:** 1/8" tempered hardboard  
**Control:** Digitrax DCC

second iconic structure that I had built myself: a compressed version of the Rocky River Viaduct that I'd seen in so many photographs. I also had several steel mill structures from my first layout, and steel operations would provide switching opportunities and a destination for all sorts of rolling stock.

Putting all this together gave me a map of the part of the NKP I would use for my layout: Fostoria to Rocky River,



**6** An overview of the yard at Bellevue shows it to be the busy hub of the system, which extended from Buffalo, Cleveland, and Wheeling on the east to Chicago, Peoria, and St. Louis on the west.

Ohio. Bellevue Yard would be the centerpiece, and the Rocky River Viaduct would grace the eastern end. I would freelance the track layout and industries at the towns and model a large steel mill scene between Lorain and Rocky River. And this time, the aisles would be wider!

### Putting it together

Construction began in summer 2010. The layout runs around the walls of the room with a center peninsula and a duckunder for entry/exit. It employs L-girder construction with ½" plywood

as a base. Layout height is 54", which places the scenes just below eye level for most people (and makes the duckunder more manageable).

The fascia and backdrop are made from ¼" tempered hardboard. There are no grades. The track is all Atlas code 55 flextrack and nos. 5 and 7 turnouts, with a few handlaid nos. 4 and 6 turnouts in switching areas.

Control is DCC using a Digitrax Chief command station and three DB150 boosters, with the layout segmented into four power districts. I use Digitrax DT402 and UT4 duplex radio throttles,

UT1 wired throttles, and smartphones running the WiThrottle app. The Java Model Railroad Interface (JMRI) DecoderPro software that's required for WiThrottle runs on a laptop connected to the layout through a Digitrax PR3 computer interface.

Switch points are lined by Circuitron Tortoise switch motors. The fascia has a track diagram with double-pole double-throw (DPDT) toggle switches to operate the motors and light-emitting diode (LED) indicator lights.

### The stuff that moves

All of the steam locomotives have sound decoders: one SoundTraxx Econami, the rest ESU LokSound. Two-thirds of the diesels also have ESU LokSound decoders. The non-sound units use ESU LokPilot V.4 decoders.

Rolling stock is from a variety of manufacturers, including Atlas, Bluford Shops, Kato, InterMountain, and Micro-Trains. All the rolling stock has body-mounted couplers. About 90 percent have Micro-Trains no. 1015 knuckle couplers. Trucks are all Micro-Trains equipped with low-profile

## Motive power

As of this writing, my steam and diesel locomotive rosters consist of the models listed below. – *John Colombo*

Steam locomotives		
Quantity	Manufacturer	Model
8	Walther'sProto	Berkshire 2-8-4
2	Bachmann	Berkshire 2-8-4
4	Kato	USRA heavy Mikado 2-8-2
1	MRC/Model Power	USRA light Mikado 2-8-2
2	Bachmann	Consolidation 2-8-0
Diesel locomotives		
Quantity	Manufacturer	Model
4	Broadway Limited Imports	Alco PA-1
15	Atlas	EMD GP7 and GP9
7	Atlas	Alco RS-11
4	Atlas	Alco RS-3
5	Atlas	EMD SD9
4	Life-Like	EMD SW8
1	Atlas	VO1000 switcher (for the steel mill)



**7** No Granger Belt railroad is complete without one "sentinel of the prairies." A member of the Midwest Central Ntrak club kitbashed this grain elevator at Maple Grove, Ohio.

wheelsets; I'm gradually converting to Fox Valley Models wheelsets.

The two passenger trains are powered by Broadway Limited Imports Alco PA-1s and are a mix of Con-Cor and Centralia Shops passenger cars with Con-Cor Railway Express reefers at the head end of the eastbound train.

Carrying the markers on my trains are four Model Power bay-window cabooses that I painted and decaled, four Atlas NE-type center-cupola cabooses factory-painted for the NKP, and 10 NKP 1000-series wood cabooses.

The 1000-series cabooses are a project that I commissioned from Matthew Meyers, the owner of South Boulder Modelworks, and are 3-D prints from Shapeways. I painted and decaled all the 1000-series cabooses.

## Operations

A full operating session involves eight operators and lasts about 3 hours. We run four mainline freights and one passenger train in each direction. One operator runs the eastbound trains, and one handles the westbounds.

Mainline freights leave from their respective staging yards and stop at Bellevue, where cars are switched out for the local trains and the steel mill and cars added for off-line destinations (Cleveland and Buffalo to the east; Chicago, Peoria, and St. Louis to the west). Power and cabooses are also changed out at Bellevue. The mainline trains then depart Bellevue and terminate at the opposite staging yard. Two local trains, each with its own crew, run out of Bellevue and serve Lorain/Rocky River and Maple Grove/Fostoria, respectively.

Whichever local operator finishes his job first also runs the "steel mill turn" to deliver and pick up cars from the steel mill at the end of the session. One operator switches the steel mill, and two operators run Bellevue – one eastbound and one westbound yardmaster. If I have enough participants, I also use a hostler to move power around at the engine terminal.

Car routing is accomplished via a simplified car-card/waybill system, and dispatching is done via the dispatcher (me) yelling orders across the room. I hope to soon replace this dispatching method with a more dignified, if not entirely prototypical, system.

## The future

About 80 percent of the layout has basic scenery in place. By "basic," I mean that buildings, roads, and some ground cover are all in place, and the



**8** Bellevue hosted Buffalo-to-Chicago passenger trains behind a pair of Alco PA-1s and Cleveland-to-St. Louis trains led by a single PA. Here's the eastbound No. 6, the *Nickel Plate Limited*, rolling through Lorain, Ohio.

track is ballasted. The areas that still need scenery work are around Fostoria, particularly the National Carbon scene, which is the one area where I'm trying to faithfully model the track arrangement and structures. Scenic details, including vehicles and figures, are needed just about everywhere.

Eventually, I hope to add signals with mainline routes controlled by a dispatcher in another room, but that's a long-term project. I also need to weather a lot of my rolling stock, but I'm making steady progress on this front using powdered pastels.

My somewhat unusual journey to the ranks of NKP modelers has been both a great learning experience and tremendous fun. Along the way I've met wonderful people associated with N scale and with the NKPHTS, all of whom have had a profound effect on my modeling efforts. The NKPHTS is simply a trove of information; were it not for our organization, I probably never would have reached my goals in modeling the NKP. I urge other modelers to support the railroad-specific historical societies that in turn support their favorite railroads.

The combination of prototype modeling with freelancing the trackwork and industries at various towns

has been a perfect choice for me, one that has resulted in an operating railroad that I think well represents the essence of the former Nickel Plate Road. **MRP**

*John Colombo teaches law at the University of Illinois. He and his wife, Tina, have two grown children. He's been modeling in N scale since 1993 and is a member of the Midwest Central RR Club (Ntrak) and National Model Railroad Association.*

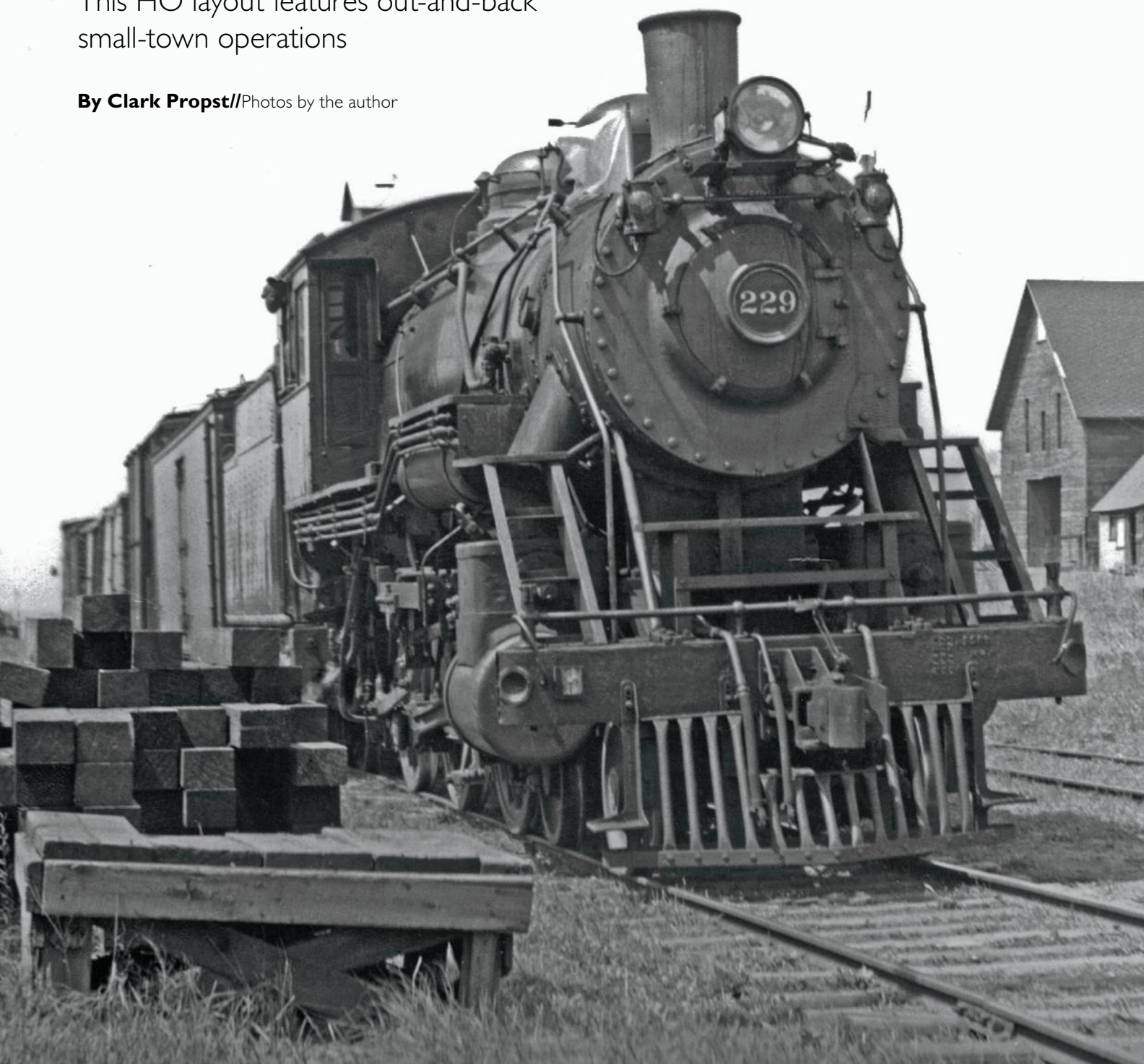
## Learning points

- The third time may indeed be the charm.
- Combining accurately modeled key structures with freelanced buildings may be sufficient to establish a locale.
- It's often practical to choose a time period when steam and diesel co-existed.
- Prototype modeling of motive power in N scale is now practical for many railroads.
- Joining a railroad-specific historical society can make modeling more rewarding.

# Modeling an **M&StL** **BRANCH LINE**

This HO layout features out-and-back  
small-town operations

**By Clark Propst**//Photos by the author



**E**ver since I had the good fortune to operate Charlie Duckworth's Bagnell Branch [see *Model Railroad Planning* 2010 – Ed.], I've been intrigued by out-and-back branchline operations. This prompted me to study the Minneapolis & St. Louis' branch line west out of Hampton, Iowa, and rail service to rural communities.

To be frank, things had become pretty ho-hum in my basement. My M&StL layout depicting Mason City, Iowa, was finished (*Great Model Railroads* 2015). I passed the time hosting regularly scheduled operations for the local group. That was fine, but the itch to build something – anything! – needed scratching. So I spent several months modeling a large local feed mill complex and associated tracks with no real plan for what to do with it when finished. I was happy building.

When we sold our house and found a new residence – that is, obtained a new basement – I had an excuse to follow Charlie's lead.

### New house, new plan

I'd developed a logical plan for this new endeavor. *Model Railroad Planning* author Harry Bilger dubbed my plan the "All Star" approach; I came to call it the "Prototype Scramble" method. Basically, I took elements of prototypes from different locations and blended them into a believable scheme. I started with a rural-town prototype track arrangement I liked and then replaced the customer buildings with similar structures. This would cut research time and allow me to build some of my favorite buildings I'd photographed over the years.

Two layout sections from my Mason City layout and the feed mill mini-layout came along with me to my new basement. But these pieces were corrupting my clean-sheet planning.

In the middle of this north-central Iowa branch line I was envisioning was the real town of Belmond, with a large soybean processing plant. In conversations I've had with retired railroad employees, I found that the branch job would switch this plant daily and only travel to the small towns farther down the line a couple times a week. During harvest season, the railroad would have a switch engine stationed at Belmond to tend to the plant's needs.

**Out-and-back branchline railroading inspired Clark Propst's new HO scale layout. This image shows Minneapolis & St. Louis no. 229 leaving Roland, Iowa.** Wm. F. Armstrong photo



**I** This comparison of a 1941 photo of Roland, Iowa, and Clark Propst's HO rendition clearly illustrate the appeal of modeling a branch of a major railroad – shorter trains, older power, and small-town ambiance. Top, Wm. F. Armstrong photo

I remember my father, an M&StL engineer, working that job for a few weeks in the fall. Belmond looked like an interesting place to operate and offered a way to use my old layout pieces. So I swapped the bean plant for the feed mill and used the other old sections to represent the town.

### A game of inches

Some quick measurements showed the old layout sections were going to be too long for my new basement. After some cogitating, I packed up my old layout sections and took them to the landfill. That left me needing a track plan to complement the feed mill.

After studying prototype station maps, I decided Britt, Iowa, would do the trick. There was enough track to perform the necessary moves associated with the feed mill, and I could use some of my buildings from the old layout to represent the Britt customers.

So far, so good, but what would I call this made-up town? Belmond was the actual location I wanted to model, Britt provided the track arrangement, and Mason City was the location of the feed mill complex. I combined the names of the contributing players and came up with "Belbritt City."

### Picking a prototype

Over the years, I'd become a fairly staunch prototype modeler. I was stacking playing cards with this "All Star" concept, and my made-up name was the wind that blew the house of cards down.

One of the appeals of the original concept was to be able to swap towns by sliding them in and out of the layout. This would allow me to continue to build models after the layout looked finished. Roland, Iowa, had a great track arrangement for out-and-back operations: one siding and two spurs with facing-point turnouts on the outbound trip. This would mean dropping cars on the siding and spotting them on the return trip.

I thought about Roland as a replacement for one of the towns on the Hampton branch. I turned the feed mill complex that was tainting my thinking into a wall ornament and placed Roland where it belonged, on the Story City Line. I had track maps for the Story City Branch in central Iowa. Why not just model the Story City Branch?

### Question everything

Now that I sold myself on modeling the Story City Branch, how much could



**2** 44-ton diesel locomotive no. 149 eases past the depot at Story City, Iowa. Clark models the period when small steam and diesel power are both appropriate.



**3** Mogul no. 316 picks up a reefer at Hegland Produce in Roland. Note the white flags on the reworked Bachmann model that denote this as an extra train.

I fit in my basement? Or, a better question, how much did I want to build at age 69? Another important question: Who was I going to build the layout for? Was I going to try to build something the local operating group could run for a couple hours at a time, or build just enough for me and a friend to run occasionally? The Story City Branch track arrangements are so simple that a one- or two-man crew is all that will be needed to operate the layout.

I claimed half of the basement for my layout. There's a row of posts down the center of the basement making a rectangular area 13 x 20 feet for the layout. I chose three towns to model: Story City, Roland, and Zearing, the latter added because of the number and diversity of the customers there.

I could make the towns fit in the basement by building benchwork in the shape of an elongated E. Story City would be the top of the E along the long wall. Roland and Zearing would be back to back on a peninsula down the center of the room forming the center

of the E. The bottom of the E would be open staging along the posts down the center of the basement representing Marshalltown, Iowa.

### Building the branch

I do much better work sitting down rather than standing. I built the towns on bases that would slide onto the benchwork. That way, I could build on a table while seated.

I drew up different support systems for the bases. I settled on one with the benchwork made up of storage shelves with L-girders on top for the layout sections to slide onto. Once a section of shelving was in place, I'd build a town on a framework while seated at a table. Once satisfied, I'd slide the sections in place and add the connecting pieces of open country in between.

Phase 1 would be Story City; I'd then worked backward to staging. Once Story City was finished, I'd add movable staging to the end so the layout would be operational while I worked on phase 2, Roland.

### The layout at a glance

**Name:** Story City Branch

**Scale:** HO (1:87.1)

**Size:** 13 x 20 feet

**Prototype:** Minneapolis & St. Louis

**Locale:** central Iowa

**Era:** September–October 1949–'50

**Style:** linear walk-in

**Mainline run:** 70 feet

plus staging

**Minimum radius:** 28"

**Minimum turnout:** no. 5

**Maximum grade:** none

**Train length:** 3 feet

**Benchwork:** L-girder with extended-foam insulation board or 1 x 2 frame with Homasote

**Height:** 54"

**Roadbed:** Cascade Models milled Homasote

**Track:** code 55

**Scenery:** extruded-foam insulation board

**Backdrop:** photos on tempered hardboard

**Control:** Digitrax DCC

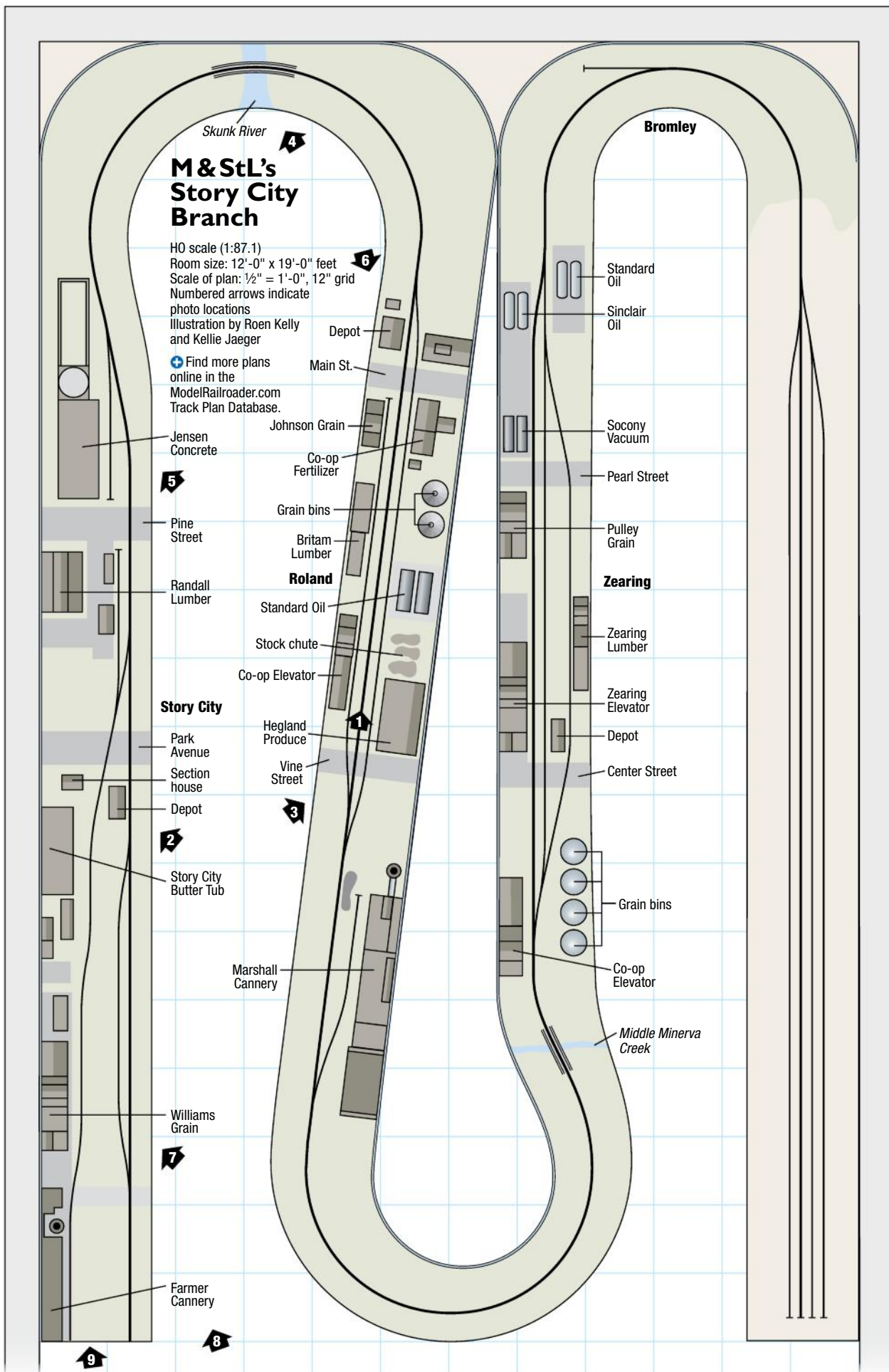
When Roland was finished, I'd move the staging past it and would be able to operate through Roland to the end of the line at Story City. I would build Zearing last as phase 3, moving staging to its final location. With all three towns in place, I would push the loop at the end of the peninsula as far down the center of the room as possible, giving me open-country running between Zearing and Roland, phase 4.

If I later feel the urge to model something more, I will build another town on the branch, perhaps McCallsburg, where the M&StL crossed and interchanged with the Rock Island, and substitute it for one of the other towns.

### How much research is enough?

I spent a great deal of time researching my last layout before cutting wood. I discovered that research is a great deal of fun. Although I didn't really feel like taking the time to do that much research again, I did obtain track charts and station maps from members of the M&StL Yahoo group. Sanborn fire-insurance maps, which provided structure information, and photos were given to me by gracious friends.

I especially appreciate the support of Gene Green, Doug Harding, Scott Sherman, and Brian Shumaker; the libraries in Roland and Zearing; and





**4** The small General Electric diesel, whose under-45-ton weight required only an engineer, creaks across a wood trestle spanning the Skunk River just east of Story City.



**5** The Martin Jensen concrete plant at Story City receives cement in covered hoppers. Clark will trim the backdrop photos along the tree line once he is pleased with their positioning.

the historical society in Story City. We took a couple road trips to the area, too. It was time to cut wood.

### Choosing the right time period

The drawings, photos, and industry lists I've accumulated aren't all from the same time period. The task was to blend these data together to make not only a believable copy of reality but also one that will be interesting to operate and have operating longevity.

The easiest way for me to do this was to delete facilities shown on the station maps, like stock pens, that I was pretty sure were gone by my chosen modeling period. I then added customers, either at a location that

seemed logical to me or where they'd best fit. Carefully choosing a period to model was very important.

There were two dates that jumped out at me that helped define my modeling date. One was the retirement of the turntable at Story City in 1942 and construction of a wye east of town. The second and most important was the abandonment of the line from Roland to Story City on Jan. 1, 1953.

My study of rural towns revealed business was best during the fall months. I've modeled the end of September and the beginning of October in 1952. Then I discovered that a connecting track was added to the C&NW in the fall of 1952, which ran

north/south on the west side of town, to the spur serving the elevator in preparation for the abandonment. So I pushed back the date to fall '51.

Then, professional railroader Barry Karlberg gave me an HO scale steam engine. This forced me to make the actual date a little less tightly defined. Bonus: Steam on the branch was replaced by the 44-tonner about 1949. Since I'm modeling the late 1940s to around 1950, I feel steam and diesel power is interchangeable without any layout changes.

I stuck with the autumn season. The railroad normally operated the branch only two days per week, but during the fall grain rush it ran daily.

### Priorities

Our new basement was literally a blank slate, with the concrete walls and floor painted gray. My wife wanted a couple walls erected to help define the laundry area. We had a plumber install the piping for a bathroom in the basement. The water service entrance and meter are located along the wall I'd claimed for Story City. The utilities in the house needed updating, so I replaced both the plumbing and wiring before putting up the backdrop and ceiling.

There is a currency equivalent in modeling called "play value" – the ratio



of enjoyment to money and time spent. On a small project like the M&St.L. branch line, it's apparent that there just isn't much daily activity. So how could I gain play value from my minimal track and customers?

The branch was served two days a week: Tuesdays and Fridays. I should think to avoid demurrage, the customers would have cars that were spotted on one trip ready for pickup the next. This means that all the cars on the layout would be moved each operating session. Most farm-belt small towns in the 20th century had a grain elevator that shipped grain in boxcars, so that would be a major source of traffic.

Let's take a look at what lading the Story City Butter Tub Co. would receive or ship. The Story City Historical Society website noted that a butter tub is a wooden basket made for the transporting of butter. Butter tubs were made from Sitka spruce, which was shipped by train from Washington. The finished tubs were shipped to creameries in central Iowa and as far north as Mason City. One tub held 64 pounds of butter.

A newspaper ad from 1940 stated that, besides butter tubs, the company sold coal, stokers, and Johns Manville roofing. With this information, I could segregate my boxcars. The raw tub material arrives in cars from Western roads. The same cars can be reloaded for regional shipment.

The stokers and roofing could be delivered in free-running cars, allowing the use of any of my favorite models. In



**6** No. 316 treads carefully as it eases up to the small wood depot at Roland, Iowa. Farmer's Co-op Fertilizer is at left, and the elevated track serving the Johnson Elevator in the distance.

the upper Midwest, gondolas were favored for coal delivery, relying on local labor to unload them by shovel, although hoppers were used as well. I could have several cars with different types of loads delivered to the butter tub plant each session, but it's doubtful that would happen. Most likely, there would only be a single car delivered to this industry during each session.

### The chicken or the egg?

After years of building layouts, I've come to know where the inspiration comes from, and why I do what I do. I look at a layout as a static model, almost a diorama. I derive great enjoyment from re-creating actual scenes. I have a mental picture of what I want a specific scene (often a Layout Design Element) to look like, knowing full well I will only be able to come close to my mental perfection.

How do I lay out a scene? Many modelers head for the drawing board and make a scale drawing for the track plan. I memorize the prototype plan I want to duplicate, so there's no reason to spend time drawing it. What's important to me is fitting the track and the structures into the available space, proportioning my rendition of reality so it looks natural. Should I lay the track first or build the structures? I felt constructing the buildings was a good starting point for a simple flatlands branch line.

My first project was building Story City. I first laid out the plan on cardboard to see how large the building bases needed to be. The depot and the elevator determined the track orientation and the size of the other buildings at Story City. The depot was important because the siding turnout is next to it, and the spur track runs

close behind it. The elevator along the back of the spur set the depth of the base, meaning the backdrop would be right behind it.

### Embellishments: Story City

There was a reason the line from Roland to Story City was abandoned in January 1953: lack of business. We modelers like to stay busy when we operate. The thought of spotting just a car or two isn't much motivation to fire up the layout.

So I studied the station maps of Story City to put together an all-time list of tracks and customers. My hope was that combining tracks and customers from different periods would still appear realistic and add to my building and operating pleasure.

For example, there was a switch-back off the customer spur to reach the enginehouse. Keeping this track would complicate the rather simple movements a bit.

## Learning points

- Visiting other model railroads may provide the inspiration for your next project.
- As you accommodate changes, it's easy to drift away from the original objectives.
- "Prototype modeling" isn't simply a case of rigorously following a full-size railroad's example.
- A move may cause the loss of some opportunities and the gain of others.
- Staging can move along with the construction of mainline segments.



**7** One of the “Louie’s” wood bay-window cabooses waits patiently as the 44-tonner switches Williams Elevator in Story City. The high doors on the coal shed at right allowed coal to be shoveled from gondolas.

I then focused on the adjacent lumberyard. I saw no need for an enginehouse, but I could definitely use the lumberyard as a customer, even though it wasn’t on any of the customer lists for Story City I’d seen.

To muddy the waters even more, in the late 1920s the track was torn out and a ramp built for unloading implements and autos at the location of the turnout. I wanted the track, I wanted the lumberyard, and now I wanted the ramp. My solution was to keep the track, keep the lumberyard, and add the ramp along the track just past the turnout clearance point.

Another track that was eventually torn out was the spur serving the stock pens at the east end of town. There was a city block between the end of the stock spur and the enginehouse spur. The Martin Jensen Concrete Co. was located on this trackless city block. I crunched space and time: To make Jensen’s a customer, I moved it to the stock track, thus shortening the layout by a city block.

Jensen made concrete blocks and decorative items from concrete. A photo of its facility suggests that it hand-packed the block molds. I automated the place by building a mixing-and-extruding tower. I also built conveyors for transporting materials from railcars to the mixing tower or storage piles.

I had two cement plants on my previous layout. I could use a couple of my covered hoppers to deliver bulk

cement to Jensen’s. There was a spur to a quarry at Bromley, one of the first stations on the branch. By laying that quarry spur, I could move aggregate and sand from the quarry to Jensen’s, giving them the needed ingredients to make concrete. Besides being plausible, I got the enjoyment of building extra structures while beefing up my operations with a greater variety of freight cars.

### **Embellishments: Roland**

With Story City basically finished and operating, I moved on to Roland. This is where I deviated from my original design. I planned to build my staging yard at the end of the U-curve east of Story City that turned the track down the center of my space onto a peninsula. I only needed a three- to five-car train to serve Story City. The train was an easy fit on the curve, so there was no need to build the staging at this time.

I was fairly faithful to the prototype when constructing Roland. My one sashay away from reality was with the original C.B. Johnson grain elevator. It was a rather different design, making it an appealing model, but did it exist during the modeled year?

The library at Roland had a book with the history of some of the prominent businesses. In the history of the Farmers Co-op, there was mention of them building a bulk fertilizer plant in 1954. It was located behind the elevator, away from the tracks.

I had a Bowser injection-molded plastic kit for an Atlantic Coast Line covered hopper of the type that was often used for hauling phosphate. I initially had no use for the kit, so I rewrote history and had the co-op use the old Johnson elevator for fertilizer before constructing a new plant. This provided the rationale to build the covered hopper and add another car type and customer.

As my friend Bob Gretillat once aptly put it, “The more you know, the less you can model” – accurately, anyway. From an M&StL Authority For Expenditure (AFE) listing supplied by Gene Green, I learned the stockyards at Roland had been retired in two segments. Several pens were torn out in 1941, the remainder two years later. In 1943, they also built a portable loading chute. I asked Gene whether he could locate any additional information on this chute.

In the meantime, I’d progressed to the point of building the chute. My reasoning suggested the railroad built this new chute at the location of the old stockyards. I combined features of several different stock chutes from drawings supplied by friends to build a plausible rendition.

After the dust had settled, I received a reply from Gene. Seems it was the cannery located east of town that wanted the chute, and it was finally built on the main line along with an alley to a nearby pasture owned by the cannery. So much for my logic!

You might ask, what does a vegetable cannery have to do with cattle? Today, ethanol plants ship large covered hoppers of corn by-product that's used in animal feed. Back in the day, sweet corn would be hauled to the cannery complete with husk and stems. This and the cob would be waste. The management at Marshall Canning decided the cows could gain weight for market from this waste. The stock chute wasn't retired until 1956, so this must have been successful.

Some modelers shy away from middle-last-century granger lines because of their heavy reliance on boxcars. I was able to create freight-car diversity on this branch by stepping slightly away from reality and using some reasonable logic. The customers on the siding at Roland are a good example.

From east to west, there was Hegland Produce, shipping poultry and eggs in reefers; the stock pens (now just a chute for loading cattle or hogs to or from stockcars); a Standard Oil wholesaler needing to be supplied with tank cars; and the C.B. Johnson elevator, which I turned over to Farmers Co-op to use for fertilizer that could come in bulk in covered hoppers.

One of the complications of building towns as removable sections is having the main track thread them together. Roland was built on a table and placed on the center peninsula with a turn-back curve at the end. I wanted Roland and Zearing to be back-to-back on this peninsula. But the curve is much wider than the slide-in town shelves.

I thought about positioning the curve to have equal aisle width on either side. This meant angling the peninsula towards Story City. I wouldn't know the angle until I built the curve, so I couldn't connect Roland to the U-curve from Story City. So Roland sat as a finished, but untested, island until a short section could be placed between Roland and the U-curve from Story City.

Sometimes events cause changes to the best-laid plans. I was walking between our truck and the wall in our garage when I tripped over a piece of pink foam that had fallen from a pile of material and scraps for the layout. Once I was able to get to my feet and assess the fortunately minor damage, I finished all the benchwork, thus getting all the stack of building material and scraps out of the garage. The center peninsula, U-curve from the peninsula to staging, and staging were finished. I then returned to Roland, connecting it to Story City and adding



**8** Clark built cabinets below the benchwork at Story City to store modeling supplies – the obligatory “home hobby shop.”



**9** This aerial view of Story City while under construction shows a typical small-town feature – one siding serving several industries.

the canning plant at the east end of town.

With staging benchwork built in its proper location, I temporarily laid track around the turnback curve at the end of the peninsula to stage the train bound from Roland to Story City. I'm enjoying operating two of my three towns for the time being.

### Looking on down the line

I strongly believe the generic or prototype-based granger town concept is a viable approach to building a layout. I also think that using real town names anchors your layout's location. It's just not in my DNA to freelance a real location, but I was able to rationalize “enhancing” the prototype.

I plan to incorporate a few structures from my previous layout and

build an accurate model to replace the stand-in at Zearing. The goal was to model an out-and-back rural branch line located in the Corn Belt of the upper Midwest as realistically as possible. Fortunately, with the support of good friends and several local institutions, I had access to the resources that allowed me to do that.

This project is sufficiently developed to make me feel comfortable with the planning and objectives. But, as with all plans, adjustments will be called for as the railroad progresses. I'll do my best to keep you posted. **MRP**

*Clark Propst is a regular contributor to Model Railroad Planning. He is a retired industrial electrician and gives talks about his modeling endeavors at prototype modeling meets.*



# Fitting an industry to the space

A sprawling Ethan Allen furniture plant  
designed to fit an alcove

By Neil Schofield//Photos by the author



**I** The Ethan Allen furniture factory complex at Orleans is a key scene on Neil Schofield's HO scale tribute to Canadian Pacific operations in Vermont. A 4 x 8-foot alcove under the basement stairs proved to be the perfect place for the complex.

While the entire line was appealing, CP Rail's operations in the northern part of Vermont held the most interest to me. The combination of scenery and motive power was part of my dream layout since I first read an article on CP Rail operations in a 1980 issue of *Railfan & Railroad* magazine.

### Choosing key features

To replicate the experience of CPR operations, I would have to include several specific locations on the Newport Subdivision. They included the division point at Newport Yard along with the climb up Newport Hill and the town of Richford, Vt., which served the large Blue Seal Feed Mill.

However, some of the design questions were related to how far south I could extend the Lyndonville Subdivision within the available space. I chose to avoid some of the well-known towns, including St. Johnsbury and Wells River, since I didn't feel I could accurately model those locations given the space limitations.

Rather, I had in mind several smaller towns south of Newport, including Orleans, Barton, and Lyndonville, any of which would have made interesting towns and kept the feel of rural Vermont I was looking for. All three had passing sidings with some industries that would make a nice "bookend" before entering staging for the south end of the railroad.

### CP Rail Vermont lines

In August 2013, we settled into the new house, and I spent the next year tackling the projects that turn a house into a home. The basement itself was unfinished, and before I could start building a layout, it would need significant work to add heat, finish the walls, put in a drop ceiling, and add lighting, not to mention moving some utilities around to open up the space. So there were several months of work ahead of me before I could jump into actual layout construction.

But I used the time wisely to consider track arrangements. As I surveyed the new basement, I noted the 4 by 8-foot alcove at the base of the stairs, which could be a blessing or a challenge to the design. Over the next few months, I studied the CPR's

### One of the most enjoyable

aspects of building a new layout is imagining how we can maximize the layout within the space provided. When you're a prospective homeowner, there's a certain level of excitement that comes with investigating a basement's potential. But there's more to buying a new home than sizing up the railroad room to be. My wife and I have three children, so we needed a house with four bedrooms plus a home office for my wife.

The good news was a four-bedroom house should fit nicely over a good-sized basement. That said, the house we chose did have some basement challenges. It was 28 x 32 feet, still more than enough to allow a reasonable reincarnation of CP Rail's Lyndonville and Newport subdivisions.

The two subdivisions were part of CP Rail's Vermont lines, which were a harbor of red Alco and Montreal Locomotive Works (Alco's Canadian subsidiary) units as well as blue Boston & Maine Geeps that provided a bridge line connection between Springfield, Mass., and Montreal, Quebec. The line was known as the Connecticut River Line, since more than half of its route paralleled the namesake river between Springfield and St. Johnsbury, Vt.

Most of the line was owned by the B&M to Wells River, Vt., about 20 miles south of St. Johnsbury. North of Wells River, the line was owned by the CP Rail, but operationally the B&M and CP Rail ran one joint train along the Connecticut River Line with pooled power from both railroads.



A street-level view of the Main Street crossing at the north end of Orleans, Vt., shows the sprawling Ethan Allen factory across from the town common.



The overhead door shown on the left side of the prototype for Neil's warehouse building once housed a spur track for furniture loading. A spur track along the right side is now obscured by trees.



2 The Railroad Street grade crossing splits the Ethan Allen factory and also offers a railfan's perspective for northbound CP Rail train No. 917 with three Boston & Maine Geeps. The darker sky area at right marks the deep alcove that was the inspiration for electing to model the town of Orleans and the factory.

## The layout at a glance

**Name:** CP Rail's Vermont Lines  
**Scale:** HO (1:87.1)  
**Size:** 28 x 32 feet  
**Prototype:** CP Rail  
**Locale:** Vermont  
**Era:** summer 1980  
**Style:** walkaround  
**Mainline run:** 200 feet  
**Minimum radius:** 32"  
**Minimum turnout:** no. 6  
**Maximum grade:** 1.5 percent  
**Train length:** 16 feet  
**Benchwork:** open grid  
**Height:** 48" to 56"  
**Roadbed:** lauan plywood  
**Track:** codes 70 and 83  
**Scenery:** extruded-foam insulation board  
**Backdrop:** digital photos  
**Control:** NCE DCC

Lyndonville Subdivision and the towns of Lyndonville, Orleans, and Barton.

As I learned more about CPR's line into Orleans, I quickly realized the Ethan Allen Furniture factory might be an ideal industry for the alcove. The linear nature of the main line running alongside the factory and the rail-served warehouse building set back from the main line might fit the alcove perfectly. There were two sharply curved spurs that entered the warehouse perpendicular to the main line.

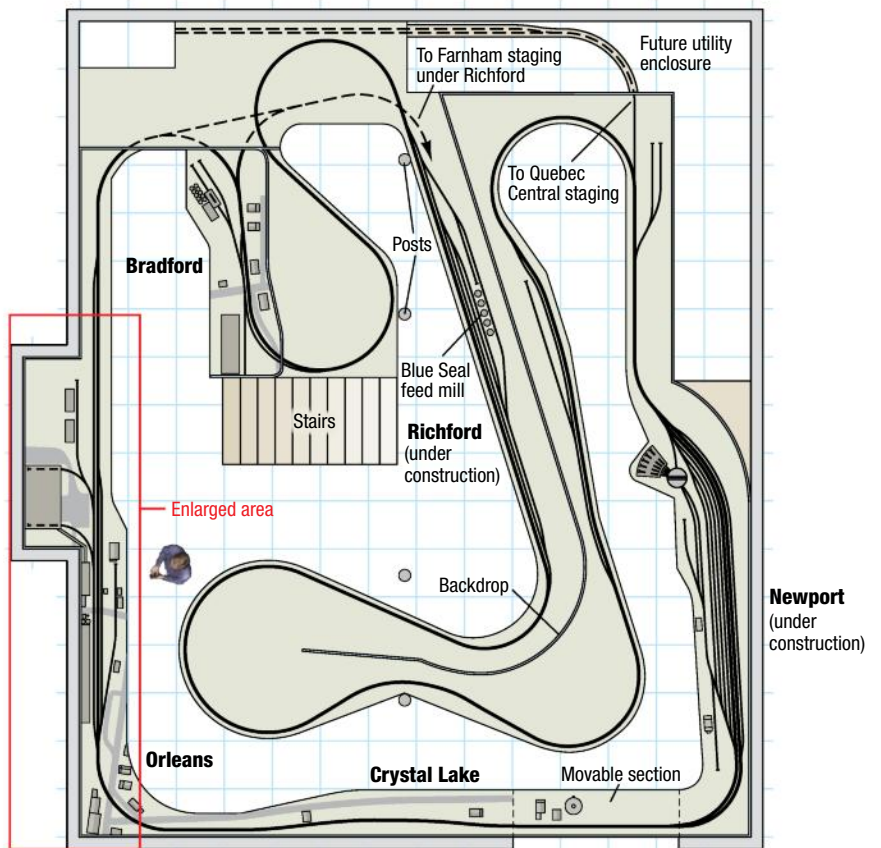
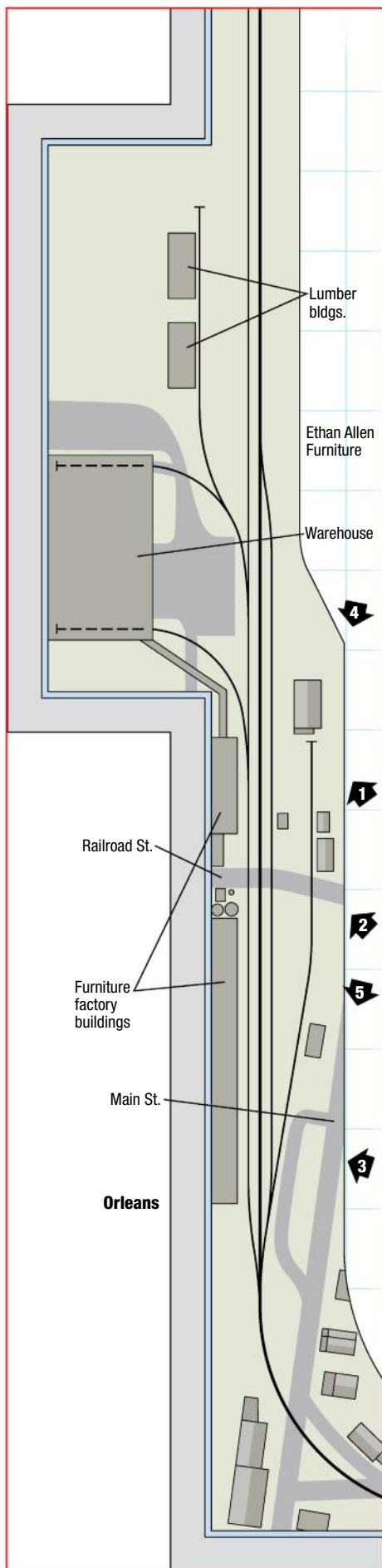
A Google Earth aerial photo showing the overall track layout at Orleans proved helpful as I envisioned how benchwork would wrap around the scene and town. I could see that the town would fit the space and provide the bookend I was hoping for.

## Prototype inspiration

Now that I knew where the layout would end and which town to model, it was time to do some research on the prototype. One of the most useful tools for such research is the Google Earth software and its Street View, which lets you zoom right in to street level. Unfortunately for some modelers, the street view is present day, which means many buildings from earlier eras are no longer there.

Fortunately, most of the Ethan Allen complex was still there, as were the major buildings in downtown Orleans. Much of my initial research was done using Google Earth to estimate building sizes and locations.

But when it came down to details, nothing beats feet on the ground, so even before benchwork construction



## CP Rail Vermont Lines

HO scale (1:87.1)  
Room size: 28'-0" x 32'-0" feet  
Scale of plan: 1/8" = 1'-0", 24" grid  
Numbered arrows indicate photo locations  
Illustration by Kellie Jaeger

began, my wife and I took a leisurely Saturday drive up through Vermont in July 2014 that included a stop in Orleans. The trip served two purposes. The first was getting lots of close-up building photographs, including all the silos, building sections, and details of the Ethan Allen complex as well as the downtown buildings and town common (square) that created a real sense of small-town Vermont. Having the photos available for reference was invaluable in re-creating the overall feel of the town itself.

The second purpose of the trip was to take photos of the areas around Orleans for use on my layout's backdrop. Since I was modeling early summer in 1980, I wanted to make the most of a partly cloudy day to take backdrop photos that I knew would add as much scenic interest as all the building details.

### Designing the track plan

Having settled on the town of Orleans and with lots of photos for inspiration, it was time to start designing the track plan. This was the first step toward re-creating and

envisioning the scene to determine whether it is believable. It was also the point where I had to decide which major buildings, in addition to the Ethan Allen warehouse, would add the most interest to the overall scene.

The town itself included the main line and passing sidings on either side of the main. The passing siding on the west side of the main was shorter and originally served a freight house with a spur track. The passing siding on the east side was long enough to allow mainline freights to pass and included a mid-siding crossover to the main, along with spurs into the Ethan Allen warehouse building.

Since I wanted trains to be at least 20 cars long with three locomotives and caboose, I needed the passing siding to be at least 17 feet long. I had to consider the siding location in relation to the spurs into the warehouse building, which were key features for modeling Orleans and maximizing the alcove space.

Each spur curved off the siding and turned perpendicular to the siding, allowing a two-car spot in either side of



**3** CP Rail RS-2 8400 pauses alongside the Ethan Allen furniture factory. A signature feature of the factory was the assembly building's sign (inset), which Neil felt had to be included on the model.

the warehouse building. This was an ideal arrangement to fill the alcove at the base of the stairs.

Complementing the Ethan Allen factory was Main Street and several of the older buildings surrounding the grade crossing and downtown common across from the factory. I'm a railfan as well as a modeler, and grade crossings are some of my favorite scenic elements to model. Including the Main Street crossing would add a nice photo opportunity to complement the corner of the basement where CPR's main line enters Orleans from the north.

On the south end of Orleans, I used the Barton River, which meandered between the Ethan Allen buildings, as a scenic element by adding a double-track girder bridge over the river as well as a through-truss bridge along the linear section before staging. This added some scenic interest and helped transition from the Ethan Allen complex to the lush green fields and valleys that epitomize the Green Mountain state.

## Structures

The main challenge with deciding to model a town like Orleans and the furniture factory was the necessity to scratchbuild all the structures, some of which were massive by model standards. While I have the skills required to scratchbuild structures, the time necessary to build them is a concern.

Fortunately, by the winter of 2014-15, the basement was partially finished. So was the basic benchwork in the Orleans area. Even better, the winter of that year was a snowy one in central Massachusetts, so once the driveway was shoveled, I had a lot of time to build structures.

After I measured the factory dimensions and stocked up on the building materials, I found the sheer size required some non-traditional construction methods. I used 1 x 4-inch PVC material to support the overall structure of both the warehouse and assembly buildings.

As the basic structures took shape, I set them in place and moved on to



other buildings, essentially using the partially completed models as mock-ups. I also set my sights on several smaller structures in Orleans, including a Sunoco gas station, Beacon feed building at Railroad Street, and the foundry at the Main Street crossing.

In all, there were about 15 structures of varying sizes that needed to be scratchbuilt. As the winter passed into spring and summer, I had partially finished nine of the buildings and outsourced two of the more complex downtown Orleans buildings to a friend in New York, thus giving me a jump-start on completing the models over the winter.

I also began construction of another section of the layout representing

## Learning points

- Google Earth images can be helpful in determining structure types and locations.
- An alcove may present unique modeling opportunities.
- Backdrops, incomplete structures, and basic scenery can give a layout a fully finished appearance.

Bradford, Vt., on the B&M, but in the interim I had finished enough of Orleans to know that the overall scene would work.

### A town comes together

As the structures started to take shape, I began roughing in some scenery including the Main Street and Railroad Street grade crossings, which split the Ethan Allen plant and passed into the backdrop. I also started to apply paint to some of the buildings and added fascia to give the layout a semi-finished look.

Within a few weeks, I began adding static grass and trees and more ground cover. It wasn't long before I could start envisioning photo opportunities as the vertical element of scenery made the town come alive. By December 2015, I was ready for my first official operating session. It wasn't much more than a few through trains and a local switching the furniture factory, but it was a good hour and a half of fun.

Through 2016 I continued to add details including telephone poles, road striping, and street signs, and I began finishing the buildings. I also added continuous backdrop photos that I'd taken back in the summer of 2014, which added a huge visual element to the town and added depth to the scenes and the alcove behind the Ethan Allen warehouse.

While progress was sporadic at times, by the end of the 2016 I was pleased with the overall pace, and the layout scenes started to represent the real town of Orleans so much that even my wife commented that it looked pretty neat, which is the ultimate compliment for me.

While there's still significant work to do on some of the structures and detailing is a never-ending job, it only enhances scenes that may already seem complete. And having the town and the Ethan Allen complex finished to this level allows me to enjoy operations and feel comfortable moving on to the other sections of the basement.



**4** The early stages of scenery show the partially completed buildings used as mock-ups to help visualize both the Main and Railroad street crossings and a portion of the Ethan Allen plant.



**5** A closer view of the left end of the Orleans scene shows the Main Street crossing, looking north. Neil's model of this scene shows outbound CP Rail train No. 904 crossing Main Street in downtown Orleans.

Next up will be the division point yard of Newport. That will be another challenging project – and something to look forward to. **MRP**

*Neil Schofield lives in central Massachusetts with his wife, three children, and the family dog. He works*

*in Holyoke, Mass., as a senior project manager for an environmental consulting firm. Thanks to his father, Ray, Neil has been interested in trains since he was 7. His childhood memories include many railfan trips throughout the Northeast. He's now about three years into his third layout.*



I Clark Hill forms a verdant backdrop as mixed-freight manifest NFSE-3 heads east from Niagara Falls to Selkirk, N.Y., behind a trio of General Electric Dash-7s along the Onondaga Cutoff on Dave Abeles' HO scale model railroad.

# A 1990s TRUNK LINE IN AN 1840s BASEMENT

Conrail's imaginary Onondaga Cutoff in HO became the solution to the challenges of a difficult space

**By Dave Abeles**  
Photos by the author

**T**hose of us who grew up in the 1980s were keenly aware that the “golden age” of railroading had passed. We heard about how great things once were, and why many people with an interest in trains were no longer excited by the ones they now saw.

In the Northeast, Conrail had taken over. Drastic changes had come, and Conrail itself was born of government action required to save the railroad industry in the region. Main lines were consolidated, even outright abandoned. But the trains still ran. And although some “old hats” hated Conrail – it replaced the beloved railroads of their memories – for many of us, Conrail is *the* memory!

Our parents dropped us off at trackside, but with no insider information or depot to visit, we had to improvise. We read the magazines. We learned about signal aspects and what they meant. We purchased scanners and learned the radio lingo to determine whether a train was coming. Switching was interesting but hard to find, and so the exciting drama was big mainline trains passing at speed, moving our nation's economy in the process.

Conrail was what we grew up with – it was “our” railroad. These big, modern trains were larger than life, and to us in our youth, as exciting as any steam engine down at the museum.



And so, as railroading neared the end of the century, we watched and learned, and the industry started to rebound. We noticed trains getting longer behind bright-blue hood units. Conrail's growing intermodal business working around carload freight operations caused congestion, and slowly, surely, we saw tracks added and yards rebuilt. Those were exciting times for the industry, and our passion for Conrail reflects that energy.

In short, the innocent exuberance of a headlight in the distance, or an approach-lit signal coming to life, was something I dreamed of capturing in model form.

### Small beginnings

My youthful modeling was in HO scale on a 4 x 8 sheet of plywood that rested on sawhorses. I grew up in an old farmhouse in western New Jersey, and operations on that small layout were limited to the most basic sort of loop running and switching.

Trackside time required non-railfan parents to make a 20-mile drive each way and was therefore limited. When it did happen, we ended up sitting at remote-control interlockings or near automatic signals on Conrail's now single-track former Lehigh Valley main line. This was a line through the woods and hills with big, albeit infrequent, trains – none of which would fit on my little railroad.

Twice-annual trips to visit family near Syracuse, N.Y., only reinforced that issue. My parents allowed me a few hours' time beside Conrail's former New York Central artery, which became Conrail's Chicago Line and was quite a bit different than the Lehigh



**2 SD50 6789 leads BRSE-7 under the westward home signals at the west end of Onondaga Yard. The signals typify Dave's keen interest in a realistic signaling system for his late-summer 1994 Conrail layout.**

Line back home. Here was a real double-track main line, with 50 or more mainline freights a day plus eight Amtrak passenger trains, moving the nation's commerce and citizens in dramatic fashion. Operation on my small layout grew less interesting.

I therefore focused on equipment – building, painting, and decaling locomotives and cars that I recognized from railfanning. And so my collection started to fill with Conrail's equipment.

Several years after landing a job with New Jersey Transit back in New Jersey, I was able to afford an old "fixer-upper" like the house where I grew up. It provided a rough base-ment that could support a layout. My

nostalgia for a Lehigh Line layout was coming into focus, or so I thought.

### Operation and a new direction

Jack Trabachino, whom I met in fifth grade, shares my passion for railroads. His O scale 3-rail layout opened my mind to a different operating experience. Jack had ideas that I never pictured: modeling a prototype interchange, using train symbols, and modeling actual car movements.

After I graduated from college, we came upon a local orphan O gauge empire; the builder had passed on, and his widow wanted to see it work again. Using Jack's equipment, we reconstructed the big 3-rail layout and began



## The layout at a glance

**Name:** Conrail's Onondaga Cutoff  
**Scale:** HO (1:87.1)  
**Size:** 20'-8" x 30'-6"  
**Prototype:** Conrail  
**Locale:** upstate New York  
**Era:** 1990s  
**Style:** walk-in  
**Mainline run:** 250 feet  
**Minimum radius:** 30" (main), 22" (yards and sidings)  
**Minimum turnout:** no. 8 (main), no. 5 (yards and sidings)  
**Maximum grade:** 2 percent (main), 8 percent (M&E)  
**Train length:** 45 feet  
**Benchwork:** L-girder and open grid  
**Height:** 46" to 59"  
**Roadbed:** Woodland Scenics Track-Bed  
**Track:** code 83  
**Scenery:** plaster-soaked gauze over cardboard web  
**Backdrop:** 1/8" hardboard  
**Control:** NCE Digital Command Control

**3** Late afternoon shadows tag along with train NPSE-8 (North Platte, Neb., to Selkirk) behind Conrail and Union Pacific power. NPSE is a run-through train from Union Pacific and frequently hosts western run-through power.

two-person operating sessions just before I purchased a home. People would come to see the sprawling 20 x 40-foot layout, with illuminated buildings and long trains led by sound-equipped engines. With the layout's multiple main tracks, there was always something moving. It was more like the Chicago Line than the Lehigh Line.

While sketches for my Lehigh Line progressed, I started to realize that because of its single-track CTC nature, there would be a lot of quiet waiting at a red signal, which for me is less interesting in HO scale than on the prototype. Further, long stretches of single track quickly filled the basement space, leaving little room for any significant switching. How could I run long HO scale trains and still have some switching?

That's when the light went on: Modeling the double-track, CTC-equipped Chicago Line would fulfill all those goals. Setting the era in the mid-1990s reflected Conrail's successes and its growing traffic base at that time, as well as memories of my first days with a driver's license and with it the ability to get trackside. I would focus on the late summer of 1994, which I remember with exuberance, innocence, and lots of Conrail blue.

## The what-if stage

Building a basement-size layout takes on a new level of complexity when it's constructed in a basement built in 1840. Having read *Model Railroader* for decades, I knew I needed to aim for gentle curves and grades, wide aisles, and robust construction. But I also knew that capturing the feel of a modern trunk line required running lots of 40- and 50-car trains.

Further, nothing in my basement (or house) is truly plumb or level. Visions of a grand layout with sufficient staging were quickly vaporized as the reality of

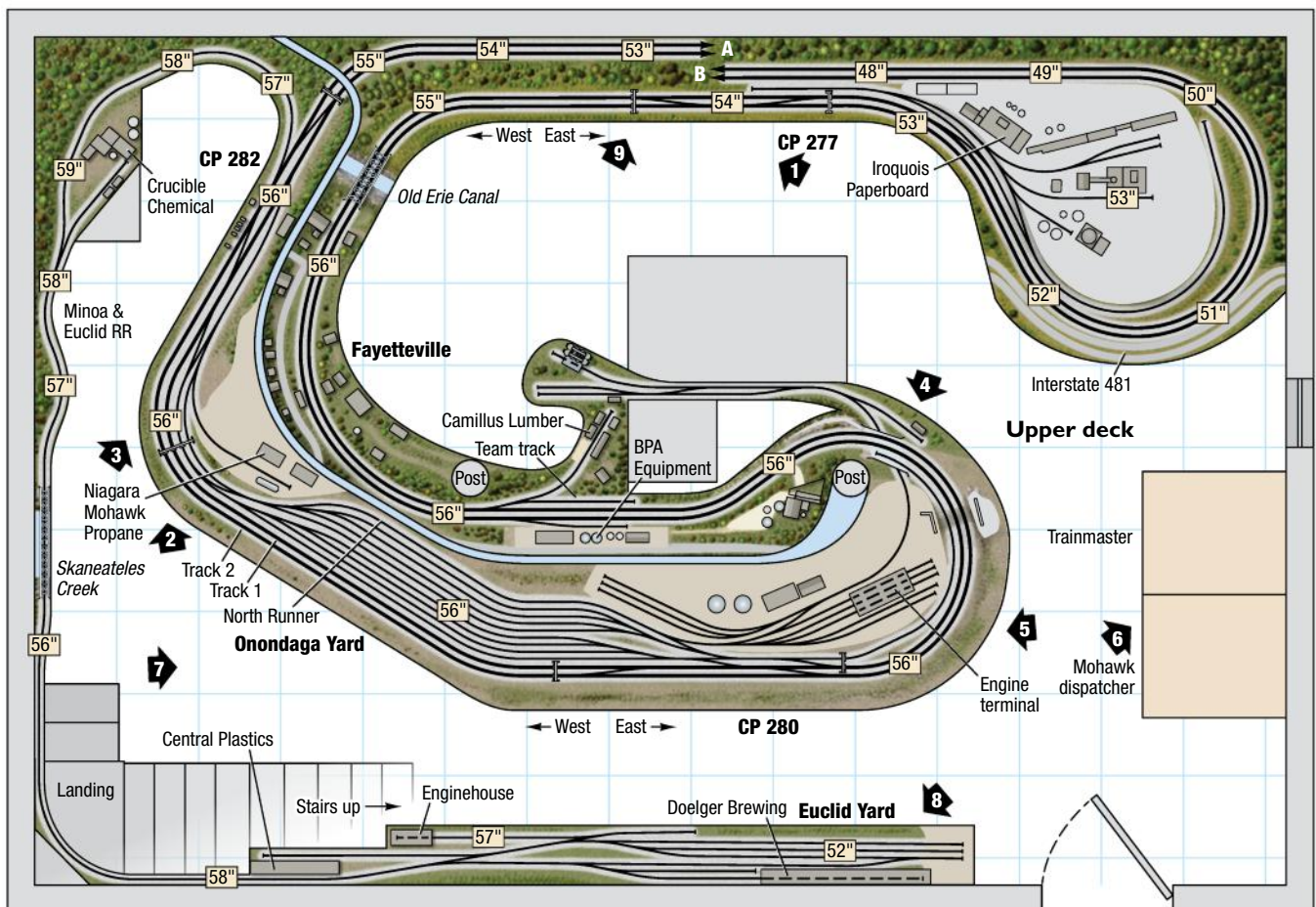
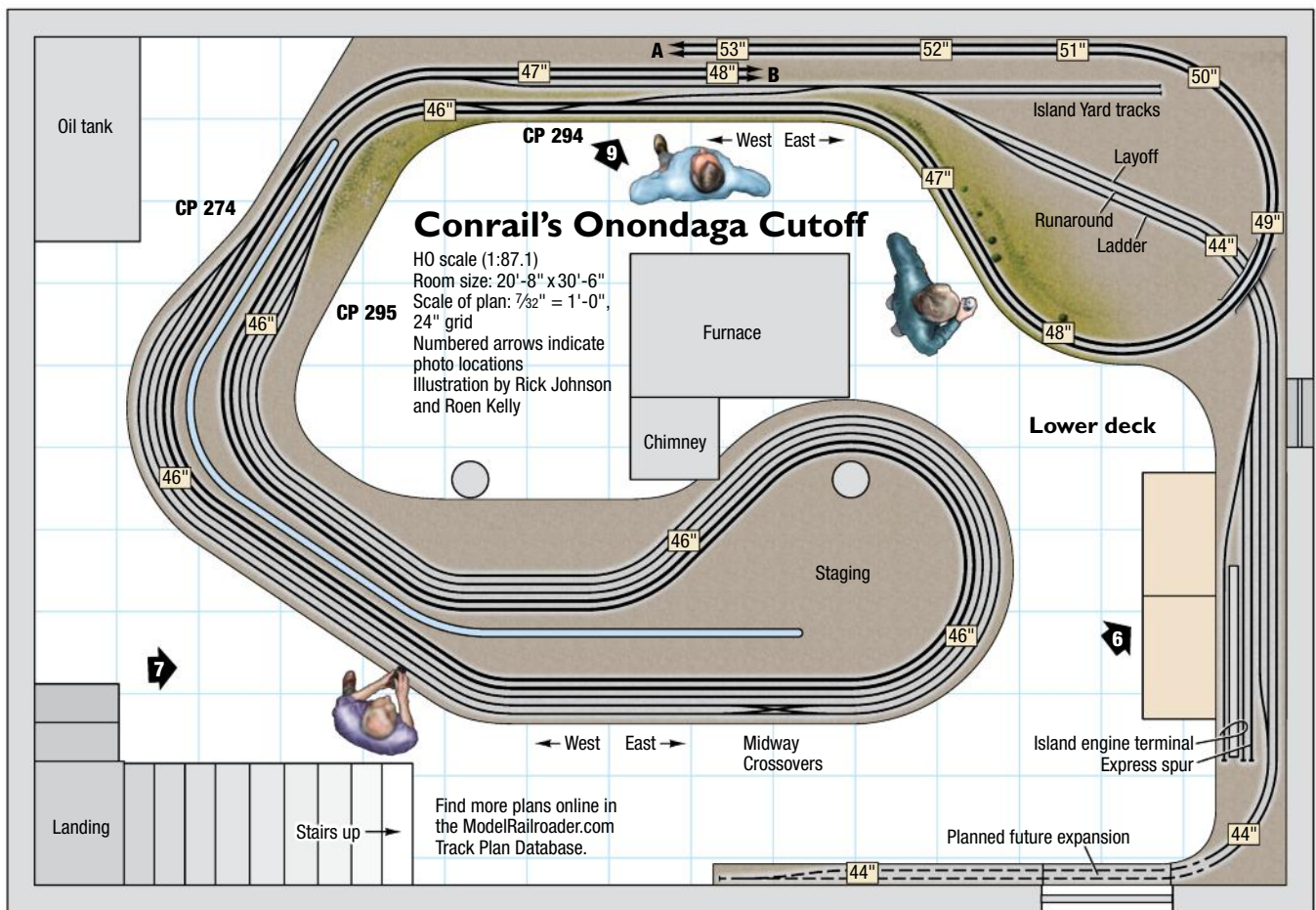
available space came to roost. Even if I had enough equipment to do so, there simply wasn't the space to stage dozens of 50-car trains.

Likewise, there was no way to capture the prototype around Syracuse in the way that I had hoped without tight curves in the wrong direction and prohibitively tight aisles. Frustrated, I turned to the prototype – and remembered that the NYC itself built cut-off routes around Syracuse and Rochester in the 1920s and 1930s to deal with traffic growth.

What if I modeled a fictional bypass through Onondaga County, a cut-off route south of Syracuse that would allow through trains to bypass busy



**4** A Conrail manifest freight rolls west through rural New York farm country. Using scenes common to the prototype locale helps to tie a fictional route to reality.





**5** Night sessions on the Onondaga Cutoff give the extensive signaling system a chance to strut its stuff in the dark as the railroad continues to move freight around the clock. Night operations were a high priority for Dave.

Dewitt Yard? This route could support a few trains working a smaller yard, some interchange to capture the variety and coordination of the prototype, and most of the intermodal trains running on the Chicago Line. The Onondaga Cutoff was born!

But how would I represent trunk-line traffic density in a small basement? Jack, by now a professional railroad service planner, used career experience in passenger train operation to hone an idea where consists of freight cars could “turn” to represent different trains during an operating session. This became a critical part of the planning: Instead of 40 sets of equipment, we could use seven or eight sets to represent 40 to 50 trains in 24 hours.

We could apply the “active staging” (fiddle yard) concept and change locomotive consists out as the session moved along so that each train had different locomotives, adding a sense of territory beyond the layout. Turning consists during a session would require only one double-ended staging area, with an engine storage area, to represent the main line and terminals both east and west of my modeled territory.

I made scale drawings of the room and began sketches for a double-track main line, a secondary line for interchange, and supporting features. Since a helix would require a large piece of my available real estate, we instead designed ramps set on a 2 percent grade to allow elevation changes

between the lower and upper decks. Bonus: The ramps could be modeled as visible territory.

The branch line, a freelanced but prototype-based short line that interchanges with Conrail, had its own challenges. On my layout, the former Delaware, Lackawanna & Western Syracuse Branch has become the Minoa & Euclid, operated under contract by Morristown & Erie, a short line in northwestern New Jersey.

Planning the Minoa & Euclid was a process that centered around overcoming existing physical obstructions – the furnace’s oil tank and the basement stairs. There was no reasonable way to maintain a 2 percent grade, but I felt it very important that there be a

separate branch operated as a short line for interchange.

The branch employs grades up to 8 percent in spots to achieve the elevation to clear the obstructions. This is extreme, but given the short nature of trains on a branch line and diesel power, the operational effects are minimal.

## Construction

While the dream of a completed layout drove the operations planning, I also began to realize that the layout would be filling my 170-year-old basement with essentially permanent infrastructure. As a civil engineer, I noted that the fieldstone foundation needed re-pointing. Iron piping, frozen valves, and ungrounded electrical systems – at least 70 years old – all worked, but advice from others was clear: The best way to ensure the layout would remain in place was to make those upgrades before the layout was in the way.

Over the course of three years, while layout planning progressed, the plumbing, electrical, and heating systems were upgraded as time and funding became available. Home repairs like these also brought a smile to my wife's face!

Home improvements done, it was time to frame out the walls and the center peninsula. Installing new studs in a home where nothing is level was a challenge. As we installed benchwork, we built a simple water level to set a constant baseline elevation. In hindsight, it would have been worth our time to purchase a laser level.

Once the baseline was in place, we calculated the elevations needed to maintain various grades. We used a mixture of L-girder benchwork and 2 x 3 lumber attached with screws to the 2 x 4 studs.

I used  $\frac{5}{8}$ " plywood for the subroadbed. Despite my using a dehumidifier, changing seasons and an old basement affect a wood frame. If I had to do it again, I would spend the extra money on  $\frac{3}{4}$ " plywood for the extra stability.

We installed the ramps to and from the staging level first, then the staging deck, and finally the upper deck. Once the subroadbed was in place, I drew centerlines for the track construction. I selected foam roadbed, secured with latex adhesive caulk.

Tracklaying began with interlockings to allow proper alignment of the turnouts. I installed Atlas code 83 track in the hidden areas and Micro Engineering code 83 flextrack on the main lines. Turnouts are Micro Engineering



**6** The dispatcher's and trainmaster's desks under Island Yard constitute the railroad's control center. Dispatching is possible from anywhere with an internet connection, using Skype software to allow remote radio communication.

no. 6 for sidings and Walthers (Shinohara) no. 8s on the main.

After installing the first interlocking atop the foam, I changed to cork roadbed at interlockings. Foam is very soft and great for sound deadening on the main line. But turnouts must be fixed firmly in place owing to the moving parts, and I found that foam was too flexible.

Onondaga Yard was laid atop construction filter-fabric, commonly used at construction sites to prevent soil run-off. It's available in 3-foot-wide rolls 50 or 100 feet long. I trimmed it to fit the space and used a staple gun to secure it to the subroadbed. This provided a sound-deadening layer while also allowing yard tracks to be installed at a lower elevation than the main lines, suggesting secondary track.

I used photo backdrops from backdropwarehouse.com. The com-

pany offers a variety of Eastern scenes that can be customized into a continuous backdrop.

## Lighting for night operations

Lighting is a key element for any layout, and from the start I wanted light that replicated outdoor light's defined shadows to create the contrast needed to bring out the details on a model. I therefore installed track lighting throughout the layout space and hung halogen bulbs and daylight-temperature light-emitting diodes (LEDs) to provide straight-line lighting. These were wired through dimmer switches, allowing me to manually fade the light to simulate sunrise and sunset.

Moreover, one of the aspects of the 3-rail operation that Jack and I wanted to carry over to the Onondaga Cutoff was the fun of night operations in full darkness. Darkness brings a different

## Remote dispatching

**The Onondaga Cutoff** is fully capable of being dispatched by a remote dispatcher logging in via the internet. Routes are lined and signals are pulled up as if the dispatcher were sitting in the layout room.

A bigger challenge was how to implement prototypical radio repeaters for the remote dispatcher. A friend, Alex Lang, developed an idea to use Skype instant messaging software's audio as the radio repeater, and to use a Family Radio Service radio using voice activation (VOX) as the microphone and speaker for Skype. This allows operators using the radio at the layout to be heard via Skype by the remote dispatcher, and when the dispatcher talks through Skype, the VOX base radio broadcasts the transmission in the layout room and can be heard on each radio.

Sessions on the Onondaga Cutoff, which is located in New Jersey, are routinely dispatched from Pittsburgh, Philadelphia, and even as far away as Florida. – Dave Abeles



**7** A double-ended staging yard representing Selkirk and points east and Buffalo and points west is tucked under the yard at Onondaga. A fabric apron will be installed around the perimeter of the lower level.

feel to railroading, and we wanted that experience to come alive on the layout. Lighting in structures and on light poles was therefore installed early in the process, and I installed aisle lighting for safety and visibility. Operating big trains overnight is one of the highlights of the sessions for many veteran operators.

### Communications and signaling

Fundamental to modern mainline railroading is the concept of interlockings, and the signals that protect them. The Onondaga Cutoff was designed for a fully functional centralized-traffic-control (CTC) signal system.

Digital Command Control (DCC) was the obvious choice for a control system, because multiple trains would be using the yard at once and there would be frequent crossover moves between main tracks. Matching the choice of most other operating layouts in my home area, I chose the NCE system. Once the track was in place, I installed insulated gaps at locations of signals and aligned power districts accordingly to support mainline operations.

Nick Anshant is the engineer and architect behind the signal system design. NCE BD-20 modules were used for block detection, wired through the NCE Auxiliary Input Unit board to the command station. Since NCE didn't offer a signal system when we were building the layout, I installed a signaling bus using Digitrax's LocoNet, which can be set up without being connected to a command station.

We linked a Windows PC running Java Model Railroad Interface (JMRI) open-source software to the command station and to the LocoNet. The JMRI software serves as the interface between the NCE block detection and the LocoNet-controlled SE-8c stationary decoders, which drive Tortoise by Circuitron switch motors and signals. This even supports flashing and approach-lit aspects. All of this is coordinated and controlled through JMRI, using Crandic Automated Traffic System software written by Rodney Black.

Crews use Family Radio Service handheld radios to communicate with the Mohawk dispatcher, the Onondaga

yardmaster, and the trainmaster during operating sessions. The radio chatter sometimes is one of the most interesting parts of a session – in effect, it sounds very much like sitting trackside with the scanner barking out conversations.

Interlockings on the Onondaga Cutoff are remotely controlled by a dispatcher, whereby routes that would

### Learning points

- An older modeler's golden age may not be seen in the same light by a younger person.
- Conrail's success in the wake of Northeastern rail bankruptcies was an inspiring story.
- A very old home will present special challenges.
- Even modeling a specific prototype, region, and era may point to some creative freelancing to meet goals.
- Night lighting and signaling lend a magical aura to a railroad.

cause a conflict are mechanically and electrically locked out. Crews and dispatchers alike must be familiar with rules governing signal aspects and movement within an interlocking, and everyone must use a radio to communicate with the dispatcher.

The signals themselves are custom-built brass models from Integrated Signal Systems with three surface-mount LEDs in each head, representing tri-color General Railway Signal SA searchlight heads. Signals and their supporting structures are constructed according to NYC prototype drawings and photographs of the modifications made during the Penn Central and Conrail era.

## Modern operations

The Onondaga Cutoff is now fully operational. Each session runs between 12 and 14 fast-clock hours on a 3:1 clock. Trains run according to Conrail's Chicago Line freight schedules in 1993 and 1996, based on research by Jack and aligned to fit a logical pattern across the railroad. Interchange moves from the New York, Susquehanna & Western – represented as trackage rights from staging – and from the Minoa & Euclid on its branch line add to the fun and complication at Onondaga Yard.

Conrail way freights call at Onondaga, and each car entering the yard is part of a master freight car forwarding plan devised by Jack with assistance from Rich Wisneski, a friend who works at New Jersey Transit. Over the course of four sessions, the railroad restages itself. This is made possible by freight trains picking up and dropping off certain blocks of cars to serve local industry and offline interchange. The result is a dynamic, varied turnover in what cars are worked during what session, further adding to the illusion of a world outside the layout.

We have approached the layout operation as a team effort. Much of the planning and implementation of the specialized parts of the operation were accomplished by experts, even down to each and every operating session where the car forwarding plan, power desk, paperwork, and other preparation are shared among three to five participants. These individuals then function as the core management team during operating sessions, taking on roles of dispatcher, yardmaster, trainmaster, and supervisor of train operations.

Most managers are, or have been, professional railroaders. The team atmosphere builds camaraderie and



**8** Morristown & Erie won the contract to operate the former Delaware, Lackawanna & Western Syracuse Branch now known as the Minoa & Euclid. The branch hosts a number of second-hand Alcos, including Century 430 no. 17.



**9** Panels along the fascia provide location labels as well as local control for crossovers, here at Control Points 294 and 277. The on/off switches help ensure the crossovers are lined with dispatcher permission, even when on local control.

allows specialists to use their talents to create an operation that is greater than what I could do alone. The layout runs best with 12 to 15 operators.

Backdrops are installed, but the scenery is just beginning. I use building flats and some stand-in structures to represent industries along the railroad. These placeholders provide visual cues for switch crews.

## Good decisions paid off

In hindsight, I'm glad that we tackled the signal installation before adding much scenery. Similarly, hosting operating sessions as soon as the main line was in place helped identify areas in need of improvement. If I designed another layout, I would work harder to allow a few more inches

of tangent track on both ends of mainline turnouts. I also would've installed a drop ceiling sooner.

The exciting rebirth of mid-1990s railroading is well underway in HO scale on the Onondaga Cutoff. I can now enjoy as well as share with others my enjoyment of the railroading of this important era. **MRP**

*Dave Abeles is a civil engineer and general superintendent at New Jersey Transit. He enjoys performing with his band, Strange River, as well as traveling, cooking, and sampling craft beer. Dave thanks his wife, Kristen, for her support, and Rich Wisneski, Nick Anshant, J. Alex Lang, Jason Wormeck, and especially Jack Trabachino for their invaluable input.*

What's an ideal layout height? Dennis Parker, who lives in the United Kingdom, built his 800-square-foot layout called "Glendower" in his home's 48"-high crawl space. He enters through a trap door in the kitchen floor. Watch a video of this layout at [ModelRailroader.com](http://ModelRailroader.com). Photo courtesy British Railway Modelling ([brm-magazine.co.uk](http://brm-magazine.co.uk))



# How high should your



It's debatable, and there are no rigid rules

By Paul J. Dolkos//Photos by the author except where noted

# railroad be?

**A**s we plan and build our model railroads, our focus is mainly on the dimensions of horizontal elements like curve radius, clearances, and track spacing as we strive to squeeze a desired configuration into the available footprint. Setting the benchwork and track height above the floor is usually not the first order of business.

Although layout height options can be debated, usually they aren't critical in determining the overall track plan, particularly with single-deck configurations. Height is, however, a bigger factor in multi-deck or mushroom layout designs.

## Factors influencing height

Outside factors influencing height decisions include the stature of the builder or the desire to lower the railroad for easy viewing by youngsters. But keep in mind those kids will be 6 feet tall before we know it. If we settle on a height a few inches higher or lower than we originally envisioned, we're likely to find it's acceptable.

For many of us, our layout space is a room with an 8-foot ceiling. If we're building a new home, it's often recommended that we request that the basement room height be increased to 9 feet or more to lessen the intrusion of utility ductwork. However, ceiling height varies considerably. If you visit enough layouts, you'll find tracks at every elevation from the floor to staging tucked into the space above a drop ceiling.

Many model railroads built today feature a single deck, although there may be multiple track levels. Single-deck heights generally range from 36" to 60". Lower heights permit an easier and longer reach into the railroad. Higher elevations encourage more realistic eye-level views.

A couple of layouts ago, my model railroad was set at about 40" above the floor. When we moved to a new home, I was able to salvage some sections of the layout and raised the height to 50". The difference was startling to me. Having the models at a higher viewing



With 50"-high benchwork, 5'-7" Travers Stavac in the foreground takes care as he reaches in 24" to uncouple a car, as his arm just clears intermediate cars. In the background, 6'-3" John Stralka has no such concerns. The impact of layout height on operations should be considered early in the layout design process.

point, I almost felt I was modeling in a larger scale.

Since then, I feel that 50" to 55" high is an ideal height range for single-deck layouts. I'm more than 6 feet tall, but this range also seems to work well for my operators and visitors. However, I did note that when an operator who is slightly less than 6 feet tall reached in to uncouple a car, his sleeve just cleared some foreground structures. For him, a 48" height would probably be better.

### Common layout heights

Many single-deck, stand-alone layouts are set at 48" or slightly higher because dimensional lumber used for benchwork legs is 96" long – one piece makes two legs. So depending on the joist and riser configuration, a 50"

height is easy to achieve. If the benchwork is cantilevered off a wall, then height is set at the builder's comfort level or influenced by physical elements in the space.

I've operated on a section of a friend's railroad that's just 36" high. I like the assignment and never thought about it being that low until he mentioned it. It happens to be the railroad's low spot; much of remainder of the layout track is 50" and higher. So in practice we seem to be more flexible on layout heights than one might think.

With multi-deck track plans, the fact that we can readily accept varying heights over time is a positive: During the planning phase, we may think elevations are either too high or too low. If the operators' views aren't obstructed and access for uncoupling is OK, then the height is probably OK.

But if one can't readily see switch-point positions or it's hard to uncouple cars using a skewer, even when standing on a step stool, then the section is probably too high. Track elevations ranging between 36" and 60" work in most cases, assuming adequate spacing between decks. The smaller the scale, the more forgiving tighter deck spacing becomes.

### Dealing with multiple decks

A handy way to analyze various multi-deck benchwork heights and even depths is to use a bookcase with adjustable shelves. Steve King described this in detail in "Visualizing layout elevations" in *Model Railroad Planning 2006*. Adjustable shelf components could be utilized. When doing

such mock-ups, don't forget to factor in the space required under shelves for lighting fixtures and switch motors.

Multiple decks can be linked with helixes or a continuous gradient on a sufficiently long main line. With the first approach, the decks can be level and the spacing established with the number of and spacing between turns in the helix. Keep in mind that a helix can take up critical floor space, and operators may chafe at the travel time though it. Placing one of the middle turns out where crews can see their trains is a great idea, as Mike Burgett explained in "Improving a helix" in MRP 2013.

With the continuous-ascent approach, the climb to the upper deck is spread out throughout the track route. So to maintain deck spacing of about 16" using a reasonable grade, one needs 350 feet or more of mainline run. Keep in mind that it's a good idea to have the track level at towns and industries so cars don't roll away.

Plotting and accurately marking the changing deck levels around the railroad room is critical. Two examples of this configuration are Bill Darnaby's Maumee Route and MRP editor Tony Koester's Nickel Plate Road. Bill's elevations are 38" at the low end and 66" at the high end; a step stool is required for operations at the 66" level. Tony set his elevations at 43" and 68½" and built a raised floor for access at the high end. Maintaining a shelf separation of 14" to 16" is an ideal goal, but less is OK where trains are simply transiting the area.

I've rejected building a multi-deck railroad, although I envisioned a short lower-deck section for a quarry for a previous railroad. It wasn't built because I didn't feel I needed the additional run, not because it was on a lower deck. And when I operate on a multi-deck layout, I have no problems with the highs and lows. This is once again evidence that we usually are very mentally accommodating about benchwork heights.

### Under-layout access

Setting the benchwork too low can create access problems underneath it. One modeler suggests the clearance underneath a layout should be not less than the height required to clear your head when you sit on the floor. This should let one install feeders, switch motors, and other electrical hardware without assuming some pain-inducing position. Working under benchwork causes many modelers to dread wiring and installing switch motors, so some

## Learning points

- There's no ideal layout height when more than one person will view or operate it.
- Elevations ranging from 48" to around 58" are popular.
- Running the railroad from rolling caster-equipped chairs is gaining popularity.
- Multi-deck model railroads present additional height-choice challenges.
- Some clubs have utilized the space under the layout for working areas and for ease of access to wiring and switch motors.

## Options with high ceilings



Having a large clubhouse with a 16-foot ceiling, The Model Railroad Club in Union, N.J., built its HO layout 10 feet above the floor to provide easy access to wiring and electronics underneath, as well as space for worktables and storage. Benchwork joists are painted white to brighten the space underneath. Two photos by Rich Laube

**A common concern** is that layout room ceilings or overhead ductwork are too low. But there are spaces with ceilings higher than the typical 7 or 8 feet. These are usually found in commercial buildings housing club layouts or outbuildings built on the owner's property. High ceilings allow for interesting configurations.

The Northern Virginia Model Railroaders club layout in Vienna, Va. ([www.nvmr.org](http://www.nvmr.org)), is housed in a Civil War-era railroad station that has a 13-foot-high ceiling. The structure is owned by the county park authority, and monthly open houses are one of the lease conditions. To accommodate visitors – most of them passing by on the former Washington & Old Dominion RR right-of-way, now a walking and bicycle trail – there is a single 3 x 43-foot aisle along the front of the layout. Rather than building the railroad in a typical flat plane, the benchwork was tiered up on several levels from front to rear. This makes it easy for visitors to see the entire railroad. At various tier levels, there are walkways for club members operating the layout.

This design also created high headroom space underneath the railroad. Members can simply walk under the layout to access most wiring, switch machines, and electronics. The tiered benchwork style also provides space in the back of the room for workbenches.

Such benchwork requires very sturdy construction. It shouldn't shake when people use the elevated

walkways. So, rather than use heavy dimensional lumber, much of the club's benchwork structure uses I-beams fabricated from plywood. This has provided a steady platform for the railroad for 40 years.

Another unusual benchwork configuration is a walk-under design by Paul Mallery and others for The Model Railroad Club in Union, N.J. ([www.tmrcl.org](http://www.tmrcl.org)). The club constructed its own building on county property. The planning anticipated the unique benchwork style, with the railroad's tabletop nominally 10 feet above the floor. This allowed full-height maintenance passages under the layout. Members can easily access wiring and electronics. The space underneath also provides easily accessible storage, critical with such a large layout project. For safety, a sprinkler system has been installed under the benchwork as well as on the ceiling.

The club's first 40 x 40-foot layout section is operational and scenicked, with a 60 x 80-foot expansion under construction. The new section utilizes the same walk-under benchwork design that allows visitors to view the railroad on three levels: an overview from a balcony, close-ups from aisles, and underneath the benchwork. They can experience many aspects of the hobby, such as construction details and electronics, not just the traditional view of trains running through scenery. The club is open to the public Saturdays from 1 to 4 p.m.

Individual modelers may want similar space flexibility, as well.

Jim EuDaly assembled a 35 x 50-foot Butler prefab metal kit structure on his property to free him from the space and height limitations of his basement. The main line of his O scale Chesapeake & Ohio layout, shown on page 56, climbs up from the staging level at 20", passing a mid-point at 55" and reaching the Allegheny summit at 68".

It's not a true multi-deck design. In some areas, higher-level benchwork overlaps the track below, but in others the track levels are terraced. This hybrid design lets Jim have open views without an intruding upper deck but still incorporates track levels more appropriate to smaller scales. The 10-foot ceiling permits Jim to extend the mountains above the uppermost tracks by 2 or 3 feet. This provides a breathtaking vista as you enter the layout building. – *Paul Dolkos*



The tiered layout configuration of the Northern Virginia Model Railroaders club lets visitors easily view trains. The tiers are high enough for walk-under access and workbenches toward the rear.



The Lehigh & Keystone Valley Model Railroad Museum's HO railroad in Bethlehem, Pa., has decks 38" and 56" high. Good clearance between decks, wide aisles, and even lighting make it easy for visitors to follow trains.



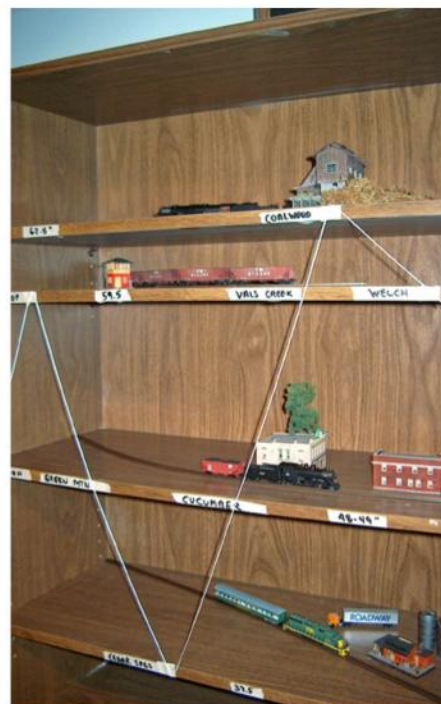
Because his basement had too many obstacles for an O scale Chesapeake & Ohio layout, Jim EuDaly (at left, next to Chuck Hitchcock) erected a 35 x 50-foot building in his backyard. The railroad's scenery extends 8 feet above the floor.

use hand-throws or sprung points to eliminate the need for switch motors. Others have embraced battery-powered "dead-rail" locomotives to eliminate wiring.

The space underneath benchwork usually gets appropriated for storage. One modeler told me Christmas decorations are stored under his railroad. One year he wondered why after the holidays some track had a noticeable hump. Sure enough, he had crammed too much stuff underneath the layout.

It's helpful if things are stored in cabinets or shelves on casters so they can be easily moved out from under the railroad for access. Fortunately, I have a large attic for storage, so the space underneath the layout remains clear, clean, and neat. Bonus: I don't have to spend money on drapes or paneling to hide stuff.

If one has to live with low benchwork and hates the idea of working underneath it, here's a possible solution: Do as much of the under-table work, particularly on yard and industrial sections, with the section standing



Standing on a step box, 5'-9" Roger Sekera easily runs the 58"-high Vals Creek yard on Steve King's N scale Virginia Midland. Six-footer Steve is standing behind Roger. Before Steve started erecting benchwork, he used a bookcase with adjustable shelves (right photo) to get a sense of the suitability of various layout heights. Shelf photo by Steve King

on edge, as one might do with a module. Design your benchwork so the track base is separate from the legs or other supports. As long as you don't plan to move the section out of the room, the size isn't critical as long as you can still handle it. Lay your track, turn the base on edge to install the switch motors and wiring, lay it back down, and test and then test again. If everything works well, then mount it permanently.

### Sitting down on the job

One reason to have track at a low level, say 24" to 36" (30" is a standard desk height), is to prepare for seated operation of a yard or industrial area. The operator sits in a roll-around chair and scoots around to uncouple cars and line switches. Seated operations should be limited to areas where few other operators are working or passing by unless the aisle space is wide enough for others to easily get by. The floor should be a hard surface that lets you roll the chair around easily. Bill Darnaby described a new branch line operated from a caster-equipped chair in "Adding the Miami Branch" in MRP 2016.

Doug Tagsold's double-deck Colorado & Southern layout [see the cover story on page 10 – Ed.] is designed for extensive sit-down operation. The lower deck is 30" and most of the upper deck is at 50", though portions climb to 64" and 66", where operators have to



Jack Ozanich's Atlantic Great Eastern has a 30-foot branch line on a 30"-high deck running under the 58"-high main line. Above Bob Milhaupt works the U-shaped terminal, which is at the end of an aisle to avoid congestion.

stand on a raised floor. If you're tall, you can remain seated in a drafting chair with the seat raised up to its highest level. When the train is running on the lower deck, the operator simply drops the chair back down to its lowest height, that of a normal desk chair.

The perfect layout heights are ones where an operator runs a train and

doesn't think about track being too low or too high. In addition, if that height solves the problems of getting around the obstacles in the layout room and other requirements, it's the right height. **MRP**

*Paul Dolkos is a regular contributor to Model Railroad Planning.*



**I** Four Electro-Motive Division GP9 diesel locomotives wait between assignments at the enginehouse on Ron Griffin's HO scale Adrian & Blissfield layout. The 13 x 26-foot model railroad depicts the 20-mile-long Michigan short line in 2010.

# Modeling a MICHIGAN SHORT LINE

**By Ron Griffin**

Model photos by the author

First generation high-hood Geeps still rule on this 13 x 26-foot model railroad

**I model the 20-mile** Adrian & Blissfield RR in HO scale. Along the 240-foot main line, I've managed to model what I consider the signature features of the prototype.

The full-size Adrian & Blissfield (ADBF) is a Class 3 short line that operates between Adrian and Riga in

Lenawee County, Mich. The right-of-way was originally part of the New York Central's "Old Road" main line between Buffalo, N.Y., and Chicago.

The ADBF's largest shippers are the Michigan Agricultural Commodities grain elevator and the Green Plains (previously Global) Ethanol plant, both

in Blissfield. The grain elevator ships numerous unit grain trains out year-round. The ethanol plant, which ships tank cars of ethanol and covered hoppers of corn mash, is switched daily.

Though the railroad serves modern industries, its motive power is from an earlier era. Adrian & Blissfield's



Adrian & Blissfield GP9 no. 1751 pulls covered hoppers out of the Global Ethanol plant at Blissfield, Mich. The cars are loaded with dried distiller's grain to be sold as animal feed. Adrian & Blissfield photo



The Adrian & Blissfield enginehouse at Adrian is a modern Butler metal building. Ron re-created the structure, shown in the image at left, using Pikestuff kit walls. Adrian & Blissfield photo

Electro-Motive Division GP9s were built in March 1957 for the Grand Trunk Western (1751) and Central Vermont (1752). The units were originally painted in the traditional green and gold colors of GTW parent Canadian National. Adrian & Blissfield successfully replicated the original paint schemes of both the GTW and "host railroad" NYC by merging GTW colors with NYC-style striping and lettering.

The railroad also has SW1200 no. 1223 (originally Bellefonte Central) and occasionally brings in other GP9s from sister railroad Jackson & Lansing in central Michigan.

The unit grain trains are interchanged with either the Norfolk Southern (former Wabash) in Adrian or the Indiana & Ohio RR (former Detroit, Toledo & Ironton) at Riga. The ethanol and corn mash from Green Plains is hauled either east or west. There are also a few smaller customers in Adrian. The ADBF operates its Old Road Dinner Train on Friday and Saturday evenings.

### Why the ADBF?

This is my fifth model railroad to date, although no previous one has

gotten to this railroad's level of completion. This time I wanted to try modeling a prototype railroad. Truth be told, I don't consider myself a very imaginative person, so I thought copying a prototype railroad would be simpler to plan and operate.

The prototype ADBF is only two hours away, making it easy to conduct prototype research. Since it's an active railroad, there are also plenty of Google Earth images available. Over time, I've become friends with one of the original ADBF owners. I'm also friends with a retired engineer and with a modeler who lives in Blissfield. Getting answers to my questions is easy with these resources.

The railroad is simplicity personified. The ADBF primarily uses EMD GP9 hood units, models of which are readily available. It operates entirely

within yard limits and therefore has no signals except for one to cross the Norfolk Southern in Adrian. Traffic is generated by customer demand.

I wanted to build a railroad that evokes the feeling that you're going someplace without creating

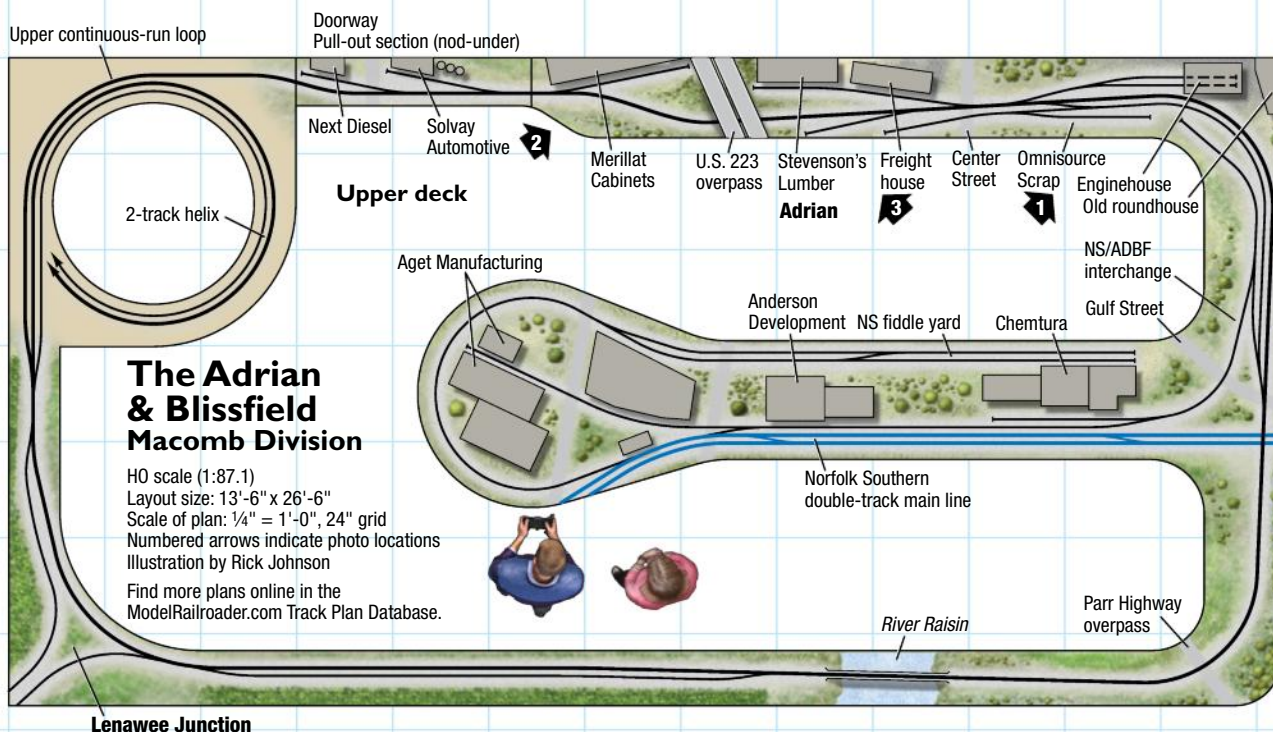
a basement empire. And I wanted something I felt I could complete while I'm still young enough to operate and enjoy it. In the round-robin groups I belong to, I operate several different styles of model railroads. I found that I like laid back, stress-free operations most.

I envisioned an operating crew of just a few people, but I still wanted to be able to run trains by myself if desired.

### Designing the short line

My HO scale Adrian & Blissfield RR Macomb Division is set in late summer 2010. It's a shelf railroad





## The layout at a glance

**Name:** Adrian & Blissfield  
 Macomb Division

**Scale:** HO (1:87.1)

**Size:** 13'-6" x 26'-6"

**Prototype:** Adrian & Blissfield  
 RR

**Locale:** southeastern Michigan

**Era:** 2010

**Style:** multi-deck walk-in

**Mainline run:** 240 feet

**Minimum radius:** 24"

**Minimum turnout:** no. 5

**Maximum grade:** 2.5 percent  
 in helix

**Train length:** 5 feet

**Benchwork:** brackets cantilevered from studs

**Height:** 39" and 57"

**Roadbed:** cork over 3/4" plywood

**Track:** Peco code 75

**Scenery:** ceiling tiles and extruded-foam insulation board

**Backdrop:** 1/2" drywall (upper) and 1/4" hardboard (lower)

**Control:** CVP EasyDCC

where operators guide their trains around the layout with wireless Digital Command Control throttles. The shelves are relatively narrow, with easy reach-in distances for switching. It's spread out with open areas for scenery. Although I didn't envision operating this railroad with a big crew, I avoided narrow aisles.

It took a number of attempts to fit everything into the room, but I think the resulting track plan ticked all the boxes except one: no duckunders (what I have is more of a "nod-under"). The design ended up a multi-deck, twice-around plan with a center peninsula and a helix between decks. The top deck is 57" off the floor, and the bottom is set at 39". West is to the left and east is to the right.

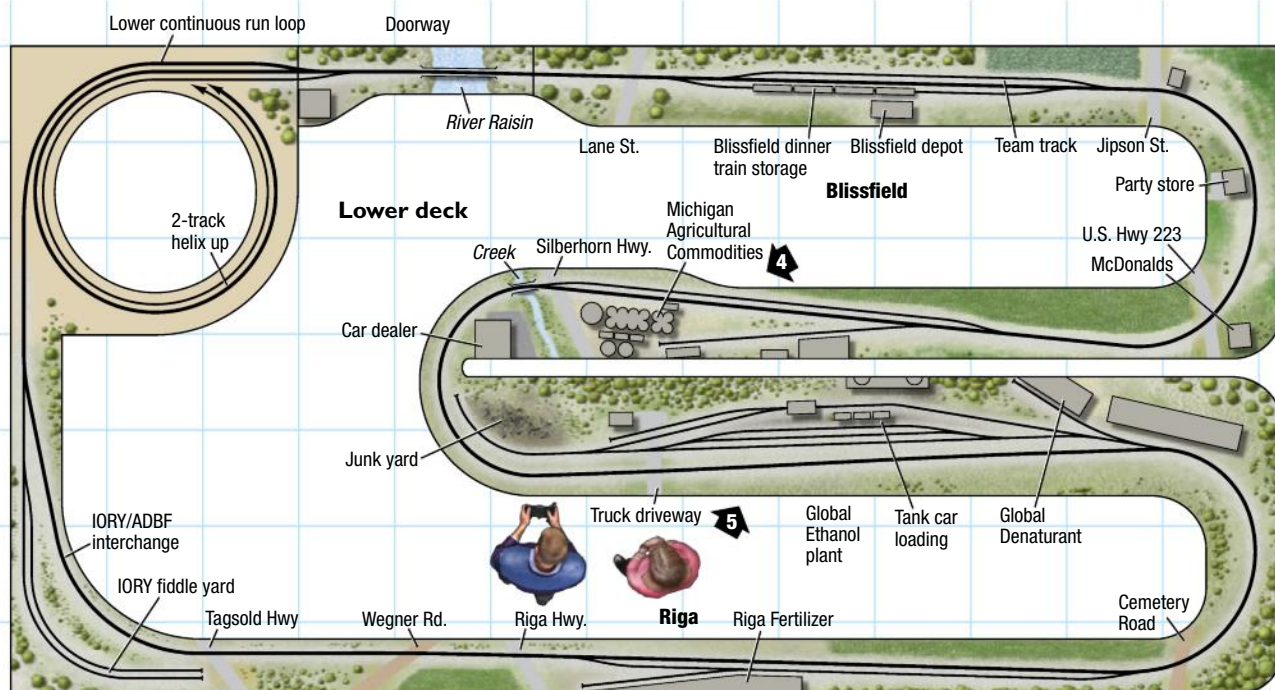
A swing gate on the lower deck and a pull-out nod-under section on the upper deck span the doorway. Being able to open sections of both decks allows big items to be moved in or out of the train room. Operators can easily enter and exit the room by opening the swing gate and nodding under the top deck during operating sessions.

By having both decks span the doorway, I got about 4 more feet of railroad per deck and was able to include a continuous-run loop on each deck for use during open houses. The railroad is always operated point to point.

I have six engines: four ADBF GP9s, one NS SD40-2, and one Indiana & Ohio GP50. The four GP9s actually started life as GP7s. They were modified to



Running prototype-length trains is achievable if you model a short line. Here, a GP9 leads five covered hoppers and a tank car near Adrian, Mich., on May 12, 2015. Doug Leffler photo



GP9s and have railroad-specific details plus custom decals by Solidesign. All six engines are equipped with Digital Command Control and sound decoders. The rolling stock is mostly contemporary, with a few “oldies but goodies” in the mix.

## Construction

The benchwork is  $\frac{3}{4}$ " birch plywood. Except for the center peninsula, the benchwork is suspended from the walls with double-slot shelf brackets. This leaves open space below for storage. City areas are built directly on the birch plywood, while tracks in rural areas are elevated above ground level by another layer of  $\frac{3}{4}$ " plywood.

The helix is suspended from the room walls with no support legs. I built the helix by gluing together and overlapping two layers of  $\frac{1}{4}$ " plywood cut into trapezoidal shapes. This minimized the amount of wood required to make the helix. The levels are separated by easily adjusted threaded rod.

I use Peco code 75 flextrack. Most of the turnouts are Peco medium radius with a couple of large radius and wye turnouts where needed. All but three turnouts are within easy reach of the aisle, allowing the switches to be lined by hand. Three are controlled by Tam Valley servos and activated by push buttons on the fascia. Mainline tracks are spiked to HO cork roadbed; I used N roadbed on the sidings. Tracks are purposely not parallel to the fascia.



**2** The Merrillat cabinet factory in Adrian, Mich., is one of the larger industries Ron has modeled. He scratchbuilt the structure by laminating plastic sheet material to a foam core base.



**3** Stevenson's Lumber by the U.S. 223 overpass receives carloads of lumber in distinctive Thrall-Door boxcars and on bulkhead flatcars.



**4** Another busy industry along the ADBF is this grain elevator at Blissfield. The towering industry receives truckloads of corn and ships it out in covered hoppers.

NS. The signal is controlled by a timer mechanism that once activated has a 20-second delay before turning yellow and allowing the ADBF to cross the NS.

### Operations

The railroad is completely operational using CVP Products EasyDCC, although only about 20 percent of the scenery is complete. I've hosted more than a dozen operating sessions to date.

There are active fiddle yards on both ends of the layout, allowing cars to be cycled on and off the railroad based on customer demand. One yard is the NS in Adrian; the other end is the Indiana & Ohio Ry. (IORY) in Riga. The NS and IORY deliver cars to their respective ADBF interchange tracks. The ADBF retrieves the cars, delivers them to online customers, and returns with outbound cars for interchange. Car movements are regulated by car cards and waybills. Trains are run in sequence.

Operating sessions last about 2½ hours and require three operators. One operator works the interchanges at both ends of the railroad (the fiddle yards) and switches the local industries served by NS. Two other opera-



The Adrian & Blissfield occupies the right-of-way of New York Central's Old Road between Buffalo, N.Y., and Chicago. According to the milepost, the railroad's popular dinner train is 217 miles east of Chicago. Adrian & Blissfield photo

Most structures will be scratchbuilt or kitbashed. I built foam-core mock-ups of the major prototype structures as stand-ins to facilitate operations until detailed models can be built. This also makes it easy to change things if I don't like what I see.

### The track plan

I've tried to keep the track plan true to the prototype. Locations are geographically in the correct sequence. Some industries were swapped to the other side of the

track or flipped end for end to accommodate fitting the railroad into the available space. Some of the industries that are no longer rail-served on the prototype have been put back into service on my model to enhance operations.

I also re-created two features that cause some frustration on the prototype, both in Adrian. One is the short three-car switchback leading to the shorter of two interchange tracks with the Norfolk Southern. The other is the signal allowing the ADBF to cross the



**5** Ron mocked up the large ethanol plant near Blissfield. He used sheets of paper for roads and photocopies of backdrop images to confirm size and spacing. The plant receives corn in covered hoppers and ships ethanol in tank cars.

tors run two trains each. I stage all the cars required for the day's operating session in the fiddle yards. The interchange operator builds each train in sequence according to waybills from the cars in the fiddle yards and sets them out on the appropriate interchange tracks.

Trains are no longer than six cars and a single GP9. Four trains run per session: One train switches the Global Ethanol plant in Blissfield, one switches the industries in Adrian, another works the industries along the main line and the IORY interchange in Riga, and the fourth is a grain train that switches Michigan Agricultural Commodities in Blissfield. I intend to add ADBF's dinner trains and several more industries.

### A little help from my friends

Although I'm retired now and able to spend more time working on the railroad, the ADBF wouldn't be where it is today without the help of my good friend Helmut Warmbold. Helmut has helped with lots of different aspects, such as designing the track plan, building benchwork, and weathering cars. He's currently working on some of the buildings.

Other friends who have helped along the way include Kevin Baker (locomotive painting), John DePauw (layout room wiring), and Paul Quintus (backdrop and light valance installation).



The ADBF will run multiple units on occasion, such as on this long grain train. The railroad also puts a Geep on each end of the train when spotting cars at industries with a facing-point switch but no runaround. Adrian & Blissfield photo

## Learning points

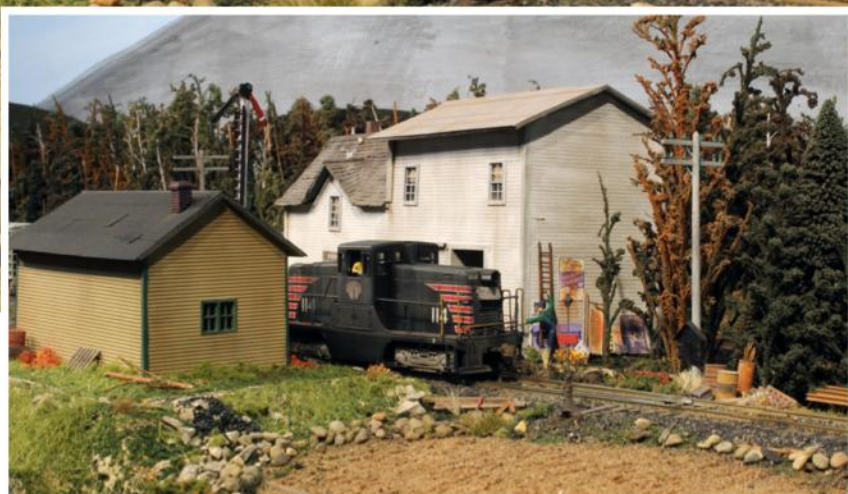
- Modeling a nearby prototype makes it easy to gather information, especially if it's still in operation.
- Crew size is an important consideration when designing a layout for operation.
- Providing for a continuous run makes it easier to host open houses.
- Including industries that are no longer active is a minor transgression.
- Hosting operating sessions before completing the scenery makes it easier to accommodate needed changes.

Although a long way from complete, I'm happy with my railroad so far. Operations have worked out as I envisioned, and friends seem to enjoy operating on the Adrian & Blissfield. The layout has given me lots of enjoyment, and I look forward to continuing to work on it. **MRP**

*Ron Griffin, a retired IT professional, is married with a grown daughter. He and his wife, Lynn, live in Macomb, Mich. Ron is an avid golfer and auto-racing enthusiast.*



Swapping the Petersburg depot for a maintenance-of-way structure gives a new look to this scene. The site can also serve as Westminster Centre.



# Scene swapping

Adding variety with drop-in structures and mini-scenes

By George Dutka//Photos by the author

**M**y **White River Division** is a smaller layout, measuring 12 x 14 feet, which I built fairly quickly during four winters beginning in 2002. (For more on the WRD, see the March 2009

*Model Railroader*.) Building a smaller layout let me devote extra time and funds to detailing my layout and building many more craftsman-style structures than were actually required.

But I model rural New England, so packing more structures into an urban environment wouldn't have projected

the look I wanted. It occurred to me that perhaps the best way to handle the additional structures was to build bases that could be changed out at designated locations on the layout.

I picked two rural locations, West Barre and Westminster Centre, for this project. Both locations have one

structure on each side of the main line and are isolated from other scenes by rural scenic breaks. While a train moved around the layout, which is basically a loop, I could swap the structures at each location, giving it a totally different look.

For example, at Westminster Centre there's a spur behind the creamery. Were I to change out the creamery with a different structure, I'd have another industry to switch. Such changes would essentially double the railroad's scenic and operational possibilities.

## Gatorfoam bases

Around the time I completed my layout, I sat in on a clinic about a product called Gatorfoam ([www.gatorfoam.net](http://www.gatorfoam.net)). This is a rigid board that's easy to cut and doesn't soak up water, glue, or paint. I quickly realized this product would work well as a base for drop-in scenes. I could cut out a few selected areas to accept a Gatorfoam base I could insert with the structures and details already attached.

A bonus of using Gatorfoam bases is that it's easy to display these scenes at train shows and National Model Railroad Association events. They can also be entered in diorama contests and taken outside to allow photography in sunlight with natural backgrounds. I think using drop-ins is a real bonus to one's layout, no matter what the size.

Another bonus of using drop-in scenes is that I can build and detail them while sitting at my workbench. I don't need to spend a lot of time bent over my layout while detailing.

Currently all my scene-swap projects have been placed near the layout's edge, which is nice for photographing and viewing as my trains roll by. Having them near the edge also makes them easy to change out.

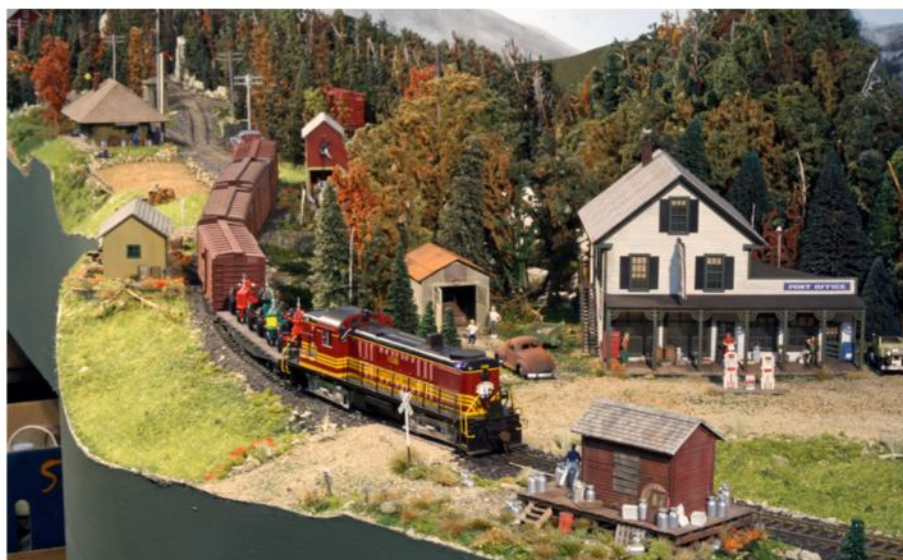
## Testing the premise

My first experiment was done at West Barre. I cut out the station area and built a new base for the station out of Gatorfoam. I used stripwood to build a box-shaped form that the Gatorfoam base fit into. Scenery and weeds built up around the stripwood box helped hide any gaps.

I cut out a smaller area across the track, which also got a Gatorfoam base. My Central Vermont-style West Barre depot was attached to the bigger base with all the details and scenery needed to hide the edges. I then added my Central Vermont/Canadian National-style section house to the smaller base across the track from the depot. The first scene was now complete.



Many of the structures on George's HO railroad are easy to remove and replace to add visual and operational variety to the compact railroad.



The structures in this nicely scenicked area look permanent, but most of them – including the milk-loading shed seen in the second “Before” scene – are made to be temporarily removed and replaced.



These four photos show how the same basic scene can be varied by swapping foreground and/or background structures.

I cut three more sets of Gatorfoam bases to fit these spaces. On a large base, I added a Boston & Maine freight house with a sign reading Fairlee.

Across the track, I built a B&M-style milk collection platform to complete scene two. The third set of bases got a Branchline Trains Laser Kit dairy barn and, across the track, a lumber storage shed. On the fourth large base, I built a Hood Creamery icehouse made from a Walthers kit. The icehouse is used to supply ice to the B&M milk platform.

I can now switch out all the structures to come up with an interesting mix of scenes. A Rutland-style section house I recently built from a Rutland Car Shops kit is another option for the smaller base. There's no end to what will work at such a location. A small grain mill, coal dealer, or factory are additional options I'm considering.

My West Barre/Fairlee depot location has no siding. A train arriving at this location stops each time around the loop. The first time around the layout, my mixed train or milk train has a station stop at West Barre. During the next loop, a stop is made for less-than-carload-lot (LCL) freight at the B&M Fairlee freight house. The third time around, a stop is made for loaded milk cans and to drop off the empties. The last time around the railroad, the train simply rolls past a barn set in a rural farm scene followed by an open field and pumpkin patch.

### Another scene swap

Once I had everything working smoothly at West Barre, I focused on Westminster Centre. This location, the junction of two subdivisions, is a key operational location. It's also the junction of a spur to a marble quarry.

Since trains on the quarry spur pass behind the creamery, this was an ideal location to set out additional cars at industries that could be changed out. Every time the local crew arrives to switch the quarry spur, a junction industry could be swapped, reflecting the local's switch list. At this location, I've also built a storage shed and a tool house that are likewise swapped.

Across the track from the industrial site is a drop-in depot called Petersburg. This familiar Atlas model has had roof modifications to reflect a Rutland prototype. The depot's plastic base was the pattern for this location's Gatorfoam bases. A second drop-in is a Rutland section house that houses a train-order office. The prototype for this structure is North Dorset, Vt. More structures are currently being examined for this location.

## Learning points

- Swapping industries lets a smaller layout accommodate an expanded mix of rolling stock and operations.
- Building on removable bases lets the scene be completed at the workbench.
- Scene swapping is more effective at locations that are isolated by scenic blocks or open spaces.
- Drop-in locations should be near the layout edges or in other readily accessible locations.
- Drop-in scenes mounted on sturdy, lightweight bases can be easily stored and displayed at model train shows and events.
- For modelers who enjoy building structures, drop-ins allow an unlimited number of structures to be used on a layout.

### Another approach

I recently experimented with another way to change out structures quickly. I have a location at Petersburg/Westminster Centre that has a flat surface hosting a creamery. The details were all glued to the ground cover. I removed the details and some of the scenery to accommodate any structure I have that will fit into the open area.

In this area, I apply the details to the structure's sides or around its base instead of building a Gatorfoam drop-in. I use canopy cement, which dries quickly and clear, and is very flexible. I attach details such as barrels, skids, blocks, lumber, weeds, ground foam, and brush along the bottom edges of the sides a viewer would see.

I have two creameries that can be swapped out. I'm in the process of building a mill that would add a third option. Grain shipments could be then dispatched to the spur. This second approach for drop-ins appears to work very well. I've found that although the structures are easier to swap, they're more fragile and easily damaged when handled. This makes them more trouble to store when not in use.

### Era changing via drop-ins

I put most of my equipment away during the warmer months to keep the dust off and to make dusting and track cleaning the layout easier in the late fall. I have had a number of visitors stop by during the past few summers, however, leaving me with a bare layout for them to view.



A scene can be brought into a more modern era by replacing the depot with a repurposed boxcar body that provides an office for an agent who covers more than one town.

I normally model the 1950s. Since I also have a number of locomotives and cars appropriate for the 1960s through the '80s, it occurred to me I could change the layout's time period during the summer months. I set up a couple of trains on the main line and a few cars in the yards appropriate for the year I choose.

At Westminster Centre, I have an out-of-service CN boxcar used as a tool shed or railroad storage. During the modern era it replaces the creamery, as most railroad-served creameries had closed by then.

I'm also making other drop-in structures that can update the model railroad to a more contemporary era: a boarded-up depot, more modern-looking lineside structures, and newer industries and signage.

### Should I?

I'm really happy with how these scenic swaps have turned out. They add greatly to how I operate my layout. As a modeler who likes to build structures, I don't have to think about whether I should. I just build whatever I like, and – as long as I don't run out of Gatorfoam – my creations will all have a home. This is an idea you might consider when designing or, as in my case, redesigning a layout. **MRP**

*George Dutka is a retired Canadian National locomotive engineer and a member of the NMRA, Canadian Association of Railway Modelers, and the Central Vermont Ry. Historical Society. He and his wife, Susanne, live in Ontario, where he also enjoys photography, sailing, woodworking, and travel.*



With the staging cassette in place in the room adjacent to the layout, Thomas Klimoski is ready to begin an operating session on his HO scale layout with the Georgia Northeastern's North Local.

# A removable staging yard

It also makes a nice outdoor photo prop

By **Thomas Klimoski**//Photos by the author

**S**taging is one of the key elements to consider when designing a model railroad. It's especially important when the layout is small and every inch of space is at a premium. While staging yards can be configured in numerous ways, they all accomplish the same goal: giving the illusion that the layout is connected to the rest of the rail network, thus providing a plausible purpose for a model railroad.

A staging yard is often compared to the backstage area of a theater from which the actors enter and exit the stage during a performance. Our trains can operate in much the same manner, where they leave or enter a staging area before or after their operations on the scenicked portion of the layout.

### Designing a cassette

I considered various types of staging designs ranging from tracks hidden below the layout to a visible yard on it. The challenge was that the layout room dimensions are 9'-2" x 10'-6". I was having difficulty coming up with a plan that gave me the staging I desired without compromising the track plan. I also wanted easy access to the yard to swap out cars, fiddle-yard fashion, during an operating session.

I remembered that professional layout designer and builder Lance Mindheim ([www.lancemindheim.com](http://www.lancemindheim.com)) had built a staging cassette for his East Rail shelf layout. It allowed him to stage a train for an operating session but was removable when not in use.

Taking inspiration from Lance's idea, I planned an 8" wide by 5'-6" long staging cassette with two tracks. That length would allow me to stage two six- to eight-car trains for an operating session, which was perfect for my situation. The staging cassette would be set up in my wife's adjacent craft room and removed when not in use.

One of management's stipulations was that the hole in the wall where the track passed through would need to be disguised when it was not in use. I accomplished this by covering the hole with a piece of artwork.

### Construction

Prior to installing drywall, I added additional 2 x 4 horizontal bracing inside the wall just below where the track would pass through. I was careful to locate this bracing at the needed height, as it provides a strong, stable structure for the attachment bolts to pass through. I used 8" long bolts to attach one end of the staging cassette to the wall when it was installed. After



With the artwork removed, the pass-through for the trains and the two attachment-bolt holes lined with brass grommets are visible. Track power is provided by the flush-mounted Cinch-Jones plug between the bolt holes.

the drywall was hung, I cut a 3½"-square hole and used wood to frame out the opening.

I built the cassette using 1 x 4 framing and cross braces on 16" centers. For additional strength, I used pocket screws as well as wood glue to reinforce the corners. I built receiver pockets for a set of removable legs in the corners on the "free" end of the cassette that rest on top of a table.

I covered the top of the framing with a sheet of ½"-thick lauan plywood, then attached a piece of 2"-thick extruded-foam insulation board to the plywood top using a foam-safe adhesive.

Next, I laid out the track centerlines and installed cork roadbed. I planned to use the staging cassette to take photos outdoors and didn't want the fascia to be visible in the photos, so I rounded the edge of the long side about ½" below the top of the foam. This allowed me to install the tempered-hardboard fascia 1" below the finished track level, which provides a better viewing angle for photos and reduces the chance that the fascia will show.

After installing the fascia, I drilled two holes in the end of the cassette for the bolts that would hold it to the wall. I temporarily held the staging cassette to the wall at the proper location and marked the location for the holes. Making sure the drill was perfectly level, I drilled two holes that passed completely through and into the framing for the layout on the other side of the wall.

Finally, I installed T-nuts in the holes on the layout-side framing for the long

### On our website

A YouTube video of Tom's staging cassette can be seen at <https://youtu.be/aiuF1Fq-UAw>

attachment bolts from the cassette to thread into. I glued brass grommets around the bolt holes in the drywall to reduce wear and provide a smooth surface for the bolts to slide into.

### Track and scenery

When construction of the staging platform was finished, I installed the turnout and laid the track. Power to the track is provided by a Cinch-Jones plug flush-mounted in the wall. On the staging cassette, the male end of the plug is attached to feeder wires. A toggle switch mounted in the fascia of the layout room lets me turn off power to the staging cassette.

I added Arizona Rock & Mineral ballast. I also used a base coat of Georgia red clay and applied Heki's Wildgras pull-apart grass mats, various other scenery materials, and a few Scenic Express SuperTrees to complete the scenery. For the final step, the cassette, leg assembly, and fascia were painted the fascia color.

### Installing the cassette

The staging cassette is stored on a shelf under the layout when not in use. To install the cassette, I remove the artwork that covers the hole and then slide the cassette partially off the storage shelf while installing the leg assembly. I insert a pin to hold the legs to the cassette while it's moved into the adjoining room.

The cassette "free" end leg assembly is then rested on a table while the other end is held in position on the wall and the mounting bolts are slid forward. The mounting bolts pass entirely through the wall and are threaded into the T-nuts on the layout

### Learning points

- Staging gives the impression that your railroad is connected to the continental rail network by allowing cars to come onto or leave the railroad.
- A removable cassette may allow use of areas normally reserved for other purposes.
- The cassette's portability may allow it to be used outdoors as a photo prop.

## Cassette used for photography



Tom applied scenery to the removable staging cassette so it can be used for outdoor photography. He positions the cassette to incorporate the natural scenery in the background for photographs like this view of a Georgia Northeastern GP38 leading a local freight through the Georgia countryside.

**Many professional photographers** use dioramas to shoot model photos in natural light. I enjoy taking photos of locomotives and rolling stock against a realistic sky and background. The cassette fits perfectly in the bed of my pickup truck, so I can easily transport it to various photo locations.

To take the "railfan" photograph accompanying this story, I went to a local park with a paved parking area next to a lake. The distant mountains and trees are on the other side of the lake. This provided a clear area free of out-of-scale distractions in the immediate background.

I placed the cassette on a pair of sawhorses against a desirable background with the sun to my back. A small piece of foam with a few Scenic Express SuperTrees placed behind the cassette blocks unwanted background scenery.

– Thomas Klimoski

side of the wall. Once everything is aligned properly, I tighten the bolts, securing the cassette to the wall, and plug in the track power. Installation of the staging cassette takes less than five minutes.

### Operations using the cassette

Staging on the cassette represents the Georgia Northeastern RR's Elizabeth Yard in Marietta, Ga. I stage two trains: the North Local and the Elizabeth Yard Turn Job. To store the cars needed for an operating session, I purchased a Seville Classics 10-Drawer Organizer cart from Walmart. The cart is stored in the train room and moved into the adjacent room as needed to set out cars on the staging cassette.

The North Local begins its day in Elizabeth Yard and travels north to switch the industries along the line in Marietta. After the North Local completes its tasks, it returns to the staging yard.

A second interchange train, the Elizabeth Yard Turn Job, then begins its day in Tate, Ga. It brings loaded cars to the Elizabeth Yard, where it drops them off to interchange with CSX and picks up empties to take back to Tate.

The staging cassette dramatically enhances the operating session and allows for two trains to be staged in little space. It gives the illusion that the layout is larger than it really is by having a place for trains to come from and go to.

### The perfect solution

The staging cassette has worked out well for taking outdoor photos and having an easily accessible location to stage trains for my layout. The best part is that it doesn't take up any floor space when not in use and is easy to set up and take down. If you're searching for an answer to your staging needs, a staging cassette may be the perfect solution. **MRP**

*Thomas Klimoski and his wife, Diane, live in the mountains of northeastern Georgia. Tom's Georgia Northeastern model railroad was featured in Model Railroad Planning 2016.*

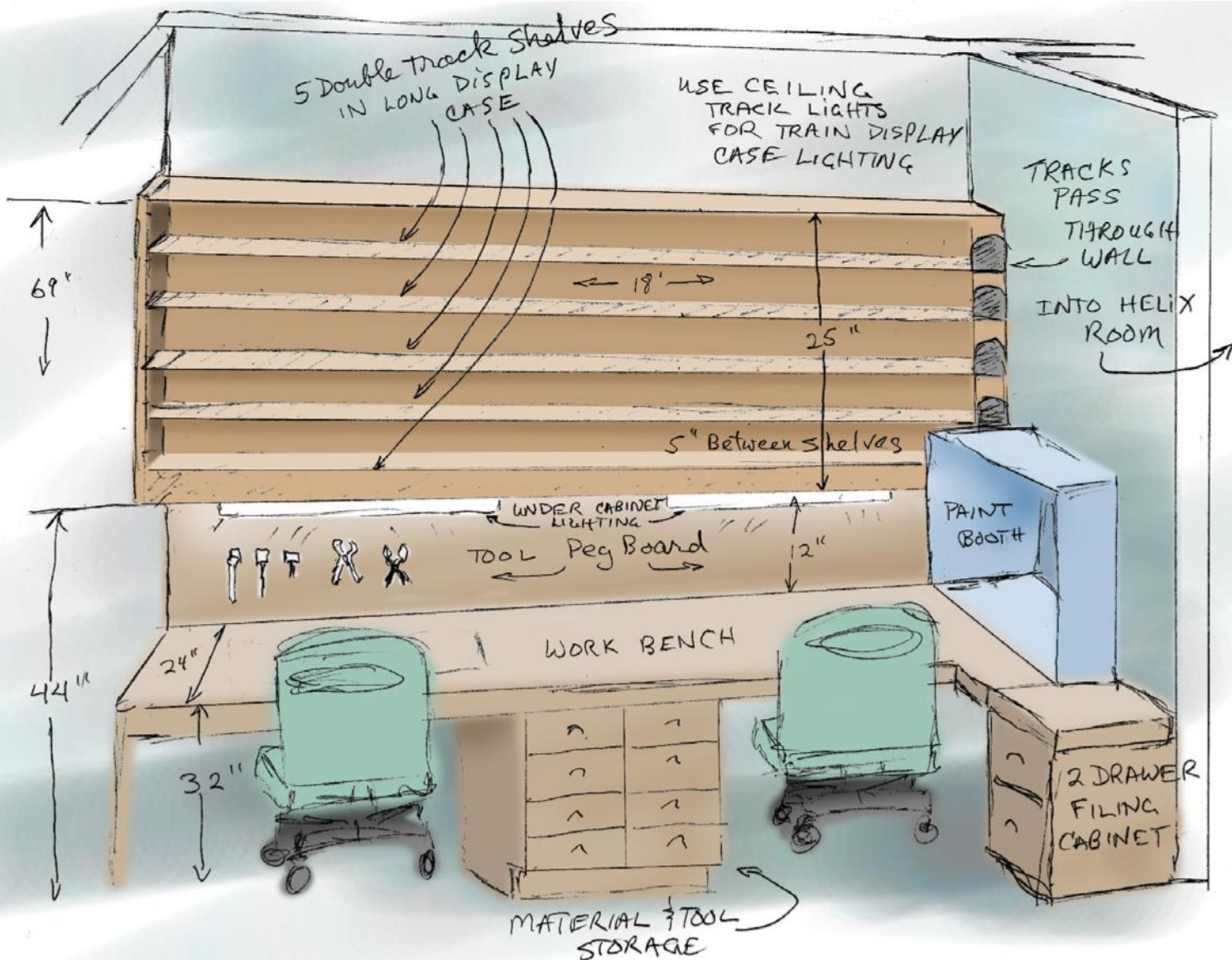


To see more of Tom's layout, watch 3-D Track Plans: The HO scale Georgia Northeastern RR at [www.MRVideoPlus.com](http://www.MRVideoPlus.com).

# Just what the doctor ordered

"Why hide my best work?" a modeler asks

By Bill Neale



Bill Neale drew this concept sketch for a friend who wanted a display case for his trains that could do double duty as a vertical staging yard. The case leaves plenty of room beneath for a workbench and storage.

**P**ounding a square peg into a round hole causes a lot of stress on the hole, the peg, and the hammer. Sometimes it's best to adapt the peg to the hole. Let me explain.

I often design layout plans for friends, but I usually don't provide a finished design. My intention is to help them determine what their layout could look like by sharing ideas and concepts. I can provide finished layout plans if asked, but often the plans I draw are only to facilitate discussion and to spark new thinking.

I tend to design complex layouts that are strongly focused on prototype operations. Of course, complex layouts and prototype operation aren't everybody's cup of tea. Think "square peg, round hole" in this case.

### Fitting the peg in the hole

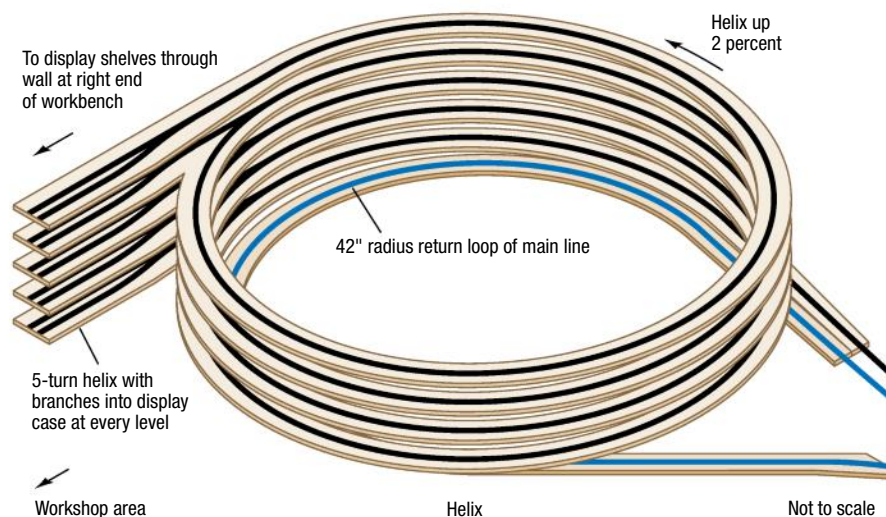
A good friend is a doctor whose modeling time is limited. Because of that, he's very careful about what hobby activities consume his time. He focuses on only those aspects of the hobby that he truly enjoys. In the past I've taken him to operating sessions, and while he enjoyed himself, it's not what he wanted for his home layout. He just wanted a layout that would show off his considerable modeling skills and allow him to "railfan" his trains. As John Armstrong put it, his "givens and druthers" were different from mine.

The doctor set aside a 20 x 26-foot area of his basement for a train room. He wanted a large work area where it would be easy to manage several projects at the same time. He also wanted to have his trains on display, and a simple layout to run them on. Any industrial spurs would be considered part of the scenery. Last, he wanted a small freight yard with a roundhouse and turntable.

### The layout

We did a lot of rough sketches and finally landed on a concept that intrigued him. He thought he could build it, although in the end, he asked a local group of layout-builders-for-hire to put it together. The important part was that the doctor thought he could easily maintain this layout over time, regardless of who built it. The design matched his givens and druthers.

We settled on a simple dogbone shape. This would allow the trains to run a reasonable distance without any sort of duckunder or drawbridge to get in or out of the room. Dogbone designs require a turning loop at each end,



A cutoff at each level of the helix leads to a display shelf. This allows the display case to do double duty as a vertical staging yard.

which consume a considerable amount of space, especially since he wanted a 36" minimum-radius curve. He models in HO scale and loves passenger trains, and a 36" radius is about the minimum for full-length passenger cars to look good. Our eventual design managed to exceed that minimum just a bit.

### No electrical complexities

He was reluctant to change his considerable collection over to Digital Command Control (DCC), so the layout was to be direct current (DC) with no reversing sections. Later, the attraction of sound-equipped engines became too great a draw, so he added toggle switches to run either DCC or DC on different sections of the railroad.

Using DC or DCC only would have allowed us to add some crossovers between the legs of the dogbone, but he didn't think he needed that flexibility. The concern was that he might inadvertently cross over between DC and DCC power districts. Running a decoder-equipped locomotive across the gap between DCC and DC power districts can fry electronics.

### Purposely visible staging

A dogbone wrapped around the room in a G shape isn't rare, but it's also not very intriguing. However, we did add one feature that was unusual: I managed to talk him into a single-track helix to access his visible staging yard, which became the salient design feature of this layout.

In most layout designs, staging yards are set under or outside the scenicked parts of the layout. Trains are hidden away to simulate coming from or going to a distant location. My doctor friend didn't like that concept.

"Why should I hide my best work in some hole where I can only see it when I decide to run it?"

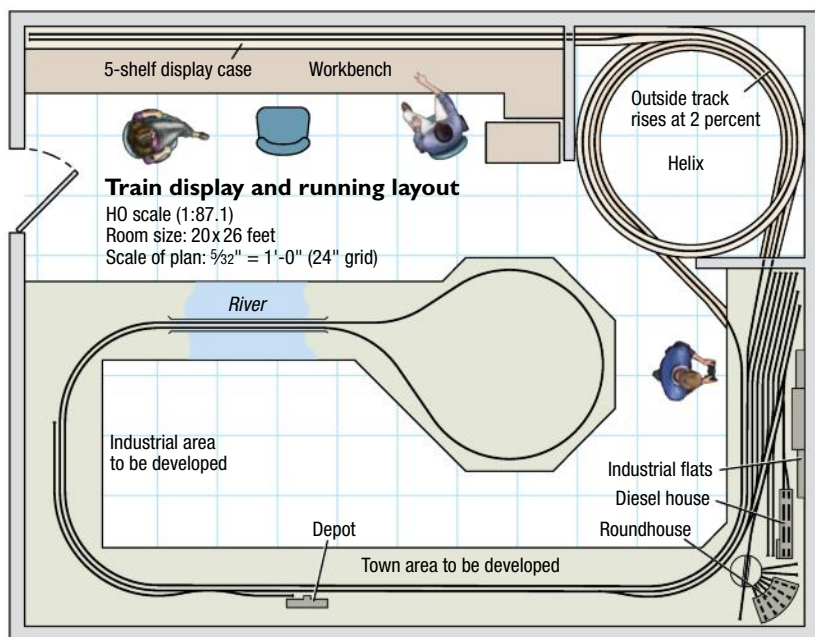
I suggested that we could use the helix to run spurs to a bank of staging tracks, built above his workbench, where he could look up and see his trains sitting on shelves. The helix would be used to reach each of the separate levels.

This approach morphed into making the staging yard a finished display case, 18 feet long, with two tracks on each shelf. The shelves are 7" wide, with the rear track slightly elevated above the track in front. The extra 1" to 2" of space between the tracks afforded a good view of both trains. We positioned the workbench 12" below the display case.

The workbench runs the length of the entire upper cabinet/staging yard. The workbench is 32" high, which puts

## Learning points

- What we find fascinating about scale model railroading may not be equally attractive to other modelers.
- Listening carefully to one's "givens and druthers" may lead to highly creative solutions to design and operational concerns.
- A staging yard can do double duty as a display case.
- Having models and entire train consists on view can be a primary design goal.
- Watching the railroad run through its paces from a comfortable swivel chair is practical.



## The layout at a glance

**Name:** Train display and running layout

**Scale:** HO (1:87.1)

**Size:** 20 x 26 feet

**Prototype:** varies

**Locale:** not applicable

**Era:** varies

**Style:** single deck

**Mainline run:** 142 feet

**Minimum radius:** 36"

**Minimum turnout:** no. 6

**Maximum grade:** 2 percent

**Train length:** 18 feet

**Benchwork:** table-top

**Height:** 40" (69" on top display shelf)

**Roadbed:** cork

**Track:** code 83

**Scenery:** not applicable

**Backdrop:** not applicable

**Control:** Digitrax DCC

the first shelf of the staging cabinet at 44". This allows for parts drawers and tool holders along the wall under the staging yard. The sight of 18 feet of storage drawers and tool holders is most impressive!

The doctor put his paint spray booth at the right end of the workbench, where he could easily vent fumes out of the house. He put a flat screen TV on the left-hand wall. The staging/display case has five shelves, each spaced 4" apart (44" to 69"). The case was built with sliding glass doors and a finished top. Enclosing the staging yard keeps the dust and dirt to a minimum.

We put the helix area (8 x 8 feet) at the other end of the workbench in its own little room. The doctor built short walls on either side of the helix room to isolate the ugly parts of the layout, but he didn't fully enclose the area. As it turned out, this was a good idea.

## Operating the helix

Trains pull headfirst up the helix and into the display case. However, to bring trains out of staging, they must be backed out of their assigned track and around the helix. No matter how good the trackwork is, it's a good idea to be able to easily watch the operation from up close. The doctor sat in one of his workbench chairs and scooted under the return loop to watch.

We also decided to put one of the dogbone return loops in the helix room. Since we'd already devoted the space to a large-radius helix, using that same space for one of the return loops doubled its utility. Because we'd set aside an 8 x 8-foot area, we could use a larger 42" radius on that return loop, improving on the 36" minimum used elsewhere. The 42" radius meant that the track would rise by 5.25" with each turn if we held the grade at 2 percent. This was adjusted slightly to match the display-case shelves.

## Setting elevations

The height of the layout was determined by the position of the display shelves in his staging cabinet. The bottom track in staging was set at 44", which dictated a 40" rail height for the layout. I thought this was a bit low, but I'm used to walkaround layouts. The doctor and I mocked up several

different heights to make sure this height worked for him. He could easily work on the layout at this level, so maintenance would be easy.

We found a bonus aspect of the lower 40" level: He could easily watch the trains run from his work chair. His grandkids could also see the trains by standing on low step stools. For the doctor, this was just right. (Another round-peg, round-hole combination.)

## Added features

We worked on the plan to include his freight yard and turntable. The yard is used very little and mostly serves as visible storage for freight cars. We added a town scene with its requisite passenger depot, then an industrial area where various high-end craftsman kits congregate.

Long ago, he had purchased a long multi-arch bridge, reminiscent of the Pennsylvania RR's Susquehanna stone bridge near Elmira, N.Y. We had to find a place for the bridge on the layout. I'd suggested that the bridge and river scene would be more realistic if we could use a backdrop behind it, and blend the scenery into a distant river painted on the backdrop. No, that wasn't one of the doctor's "druthers." The river scene was to be left open so he could watch his trains cross the bridge while he sat at his workbench.

In retrospect, this was an excellent idea. This allowed him to watch the trains across the entire railroad simply by turning around in his chair.

His staging/display case holds 10 long trains on five shelves. He installed track lighting to illuminate his workbench, plus a couple of spotlights shining on his display case. It holds a circus train, Santa Fe's *Super Chief*, Pennsylvania's *Broadway Limited*, Great Northern's *Empire Builder*, and New York Central's *Twentieth Century Limited*, as well as a wide variety of other notable consists. Each train seemed to be a shiny jewel behind the glass doors.

The doctor has an eclectic collection, to be sure, but he enjoys the ease of pulling a train out of its display track, entering to layout via a spur between that display shelf and the helix, and watching it run around the layout. He calls it "exercising the train." The ease and convenience make this a great design for his particular enjoyment of our hobby. **MRP**

*Bill Neale, a regular MRP contributor, is a retired senior program manager who models the Pennsylvania RR's Pan-handle Division in 1939 in HO scale.*

# Designing the Shasta Division

A convention conversation leads to an operation-oriented HO scale railroad

By **Byron Henderson**//Model photos by Richard Kelliher

**O**ne of my favorite parts of any National Model Railroad Association (NMRA) convention is discussing potential layout plans with attendees as part of the Layout Design Special Interest Group's free track-planning help sessions.

Richard Kelliher was one help-seeker I met in Sacramento in 2011. Richard had recently completed a large, dedicated train building and was looking forward to building an HO layout covering a portion of the Southern Pacific's Shasta Division in the transition era.

His hoped-for layout scope included one or two of the railroad bridges located to the south (railroad timetable west) of the division point of Dunsmuir, Calif. He had already acquired suitable brass models. Other high-priority elements included the Dunsmuir area itself, Mount Shasta, Black Butte, perhaps a bit of the connecting McCloud River RR (MR) – and whatever else might fit. He was already building an angular section encompassing the engine service terminal in Dunsmuir; although not yet completed and scenicked, this scene was to be incorporated.

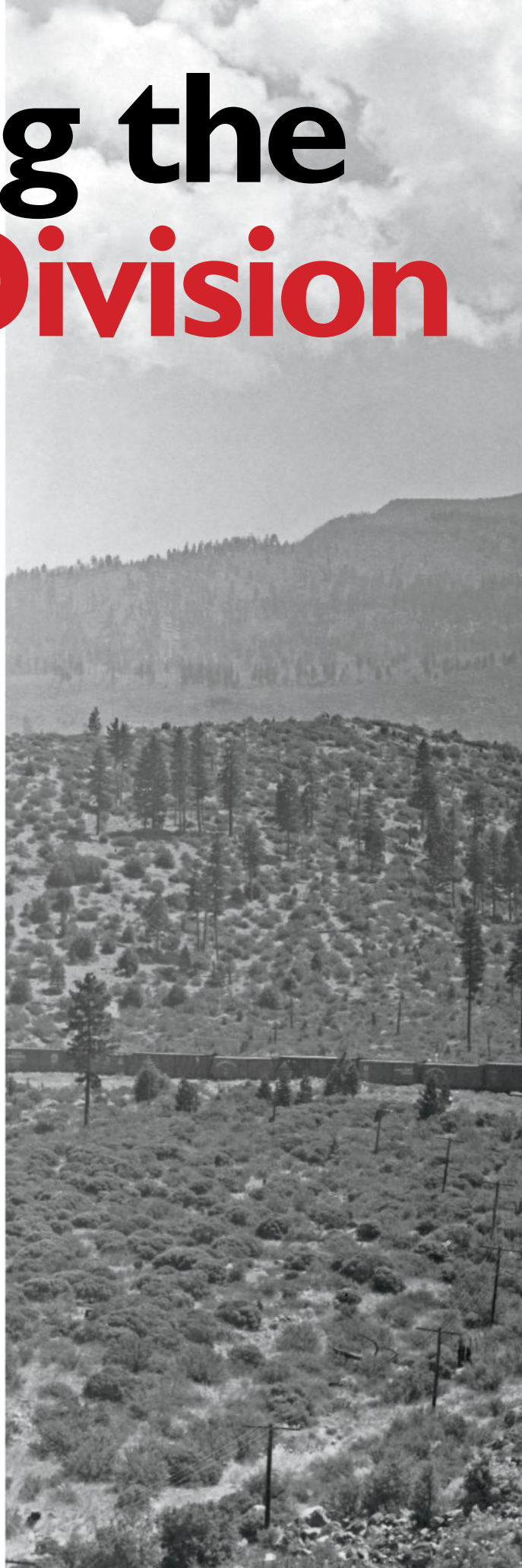
I was familiar with the area and with John Armstrong's fine design for much of the same territory on friend Otis McGee Jr.'s multi-deck HO layout (*Great Model Railroads 2011*). The builder was planning to model less of the Shasta Route compared with Otis's layout, and a single-deck visible footprint was desired (with subterranean staging as necessary).

## Windshield time is design time

During the drive back home to San Jose from Sacramento, I began to turn a potential track plan over in my mind. As John Armstrong often suggested, I was thinking about a long spiral peninsula for the basic footprint of the layout. My understanding of the space suggested it might be wide enough for four aisles – and the famous Cantara Loop was a natural to occupy the turnback-curve "blob" at the end of the spiral peninsula.

Although we hadn't discussed working together on the design, I felt that the ideas were too good not to explore, so I drew up a rough sketch of my idea in CAD. Most of it fit as I had imagined. I worked out in each direction from the end of the peninsula at Cantara, capturing my best guess of the existing engine service section within the benchwork.

I thought that there might even be room for a fair amount of the McCloud River RR (MR) on a second tier (not a separate deck). I shared a copy of the plan with the potential layout



Southern Pacific no. 4271, a class AC-11 Cab-Forward, leads a San Francisco-bound freight past Mount Shasta in 1949. The SP Shasta Division in the transition era inspired Byron Henderson's 21 x 37-foot HO scale track plan. From the *Trains* magazine collection





For 9 miles, Dunsmuir Yard paralleled the Shasta Division main line. In this 1951 photo, a freight is headed into town on the main while a Baldwin 1,500-hp diesel works the yard lead. Mac Lefebvre photo

We batted around a number of alternatives, but none seemed satisfactory. Represent Lower Dunsmuir by staging tracks? No, that wouldn't work: The builder wanted to actively replicate the block-swapping and train length adjustments that went on in Lower Dunsmuir during his modeled era. And that would also have eliminated any possibility of the bridge scenes farther railroad west. Multiple visible decks? No, the builder felt that he would have more than enough on his plate already. Move one measly wall? For some reason, this was a non-starter.

### Compressed but functional

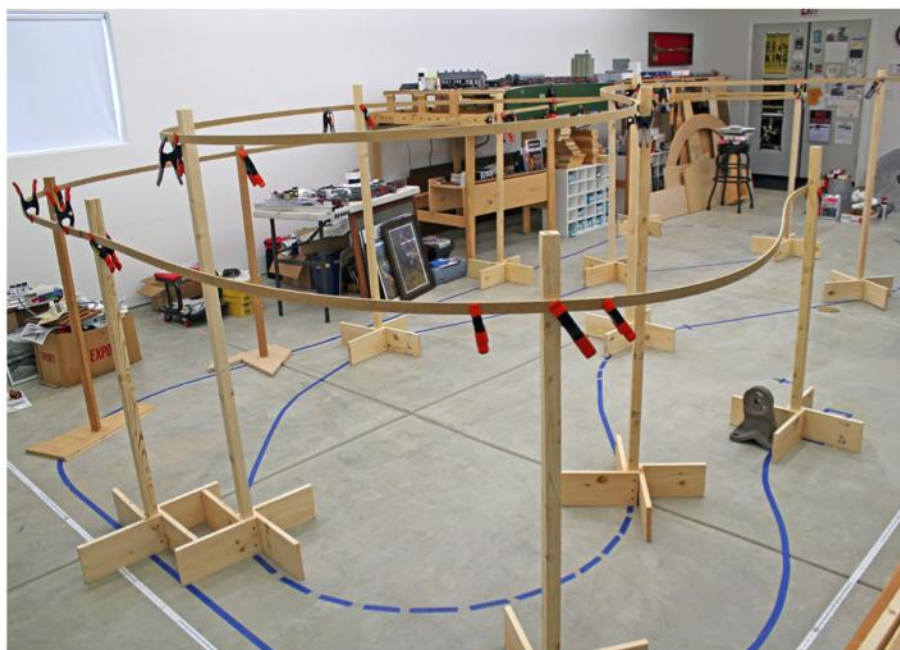
In the end, I chose to meld the upper and lower yards together. This was certainly not per the prototype, but with some minor reworking of leads and sidings, that part of the plan came together. Compromising the prototype arrangement by making a few tracks single-ended helped increase their usable length. This represented a balancing act of trade-offs that I find often applies in layout design: The track arrangements nearest the existing engine service section “looked” a bit more like the prototype, while the heavily revised Lower Dunsmuir section would “work” reasonably well.

Ideally, Dunsmuir would have been slightly longer, but instead I was able to steal enough room for a reasonably effective scene at Sims, where at least one of the beautiful brass bridges could earn its keep. This is also the first scene as visitors enter the room, so it suggests the type of country the railroad has been traveling through “off-stage” before making its visible appearance. The builder and I agreed that this scene-setting was worth some compromise in the Dunsmuir yard.

### Angling for inclusion

Fortunately, the builder's Dunsmuir engine service terminal was still in progress, and most of the tracks of the prototype were not yet installed. So I was free to set it at the optimal angle to fit into the desired benchwork footprint, and an angle to the walls worked best.

The Upper Dunsmuir tracks could then be laid out reasonably accurately, with tracks on the far side of the backdrop (ostensibly miles away at Mott) occupying the “back” edge of the existing benchwork section. Splitting the existing benchwork with the backdrop helped the large section fit in without too much compromise of



After marking the main line's location on the floor with tape, builder Richard Kelliher used hardboard strips clamped to risers to get a feel for the elevations.

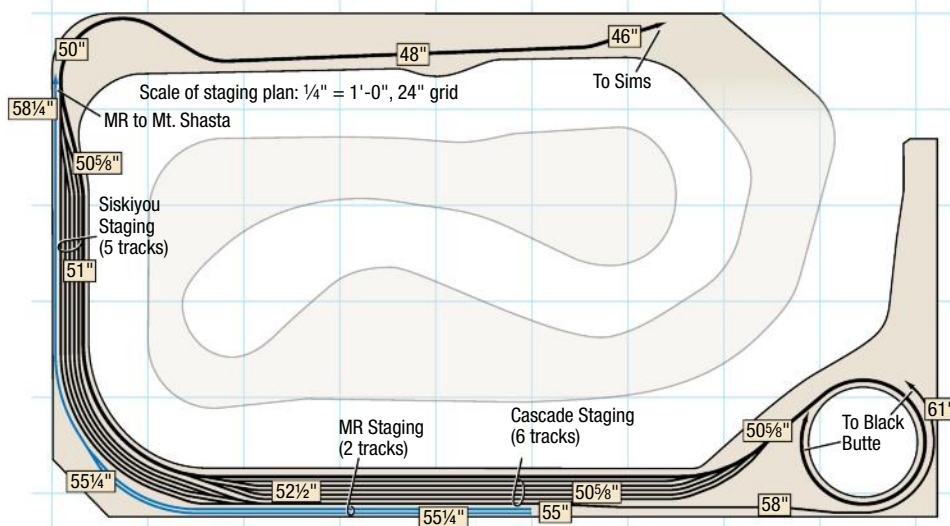
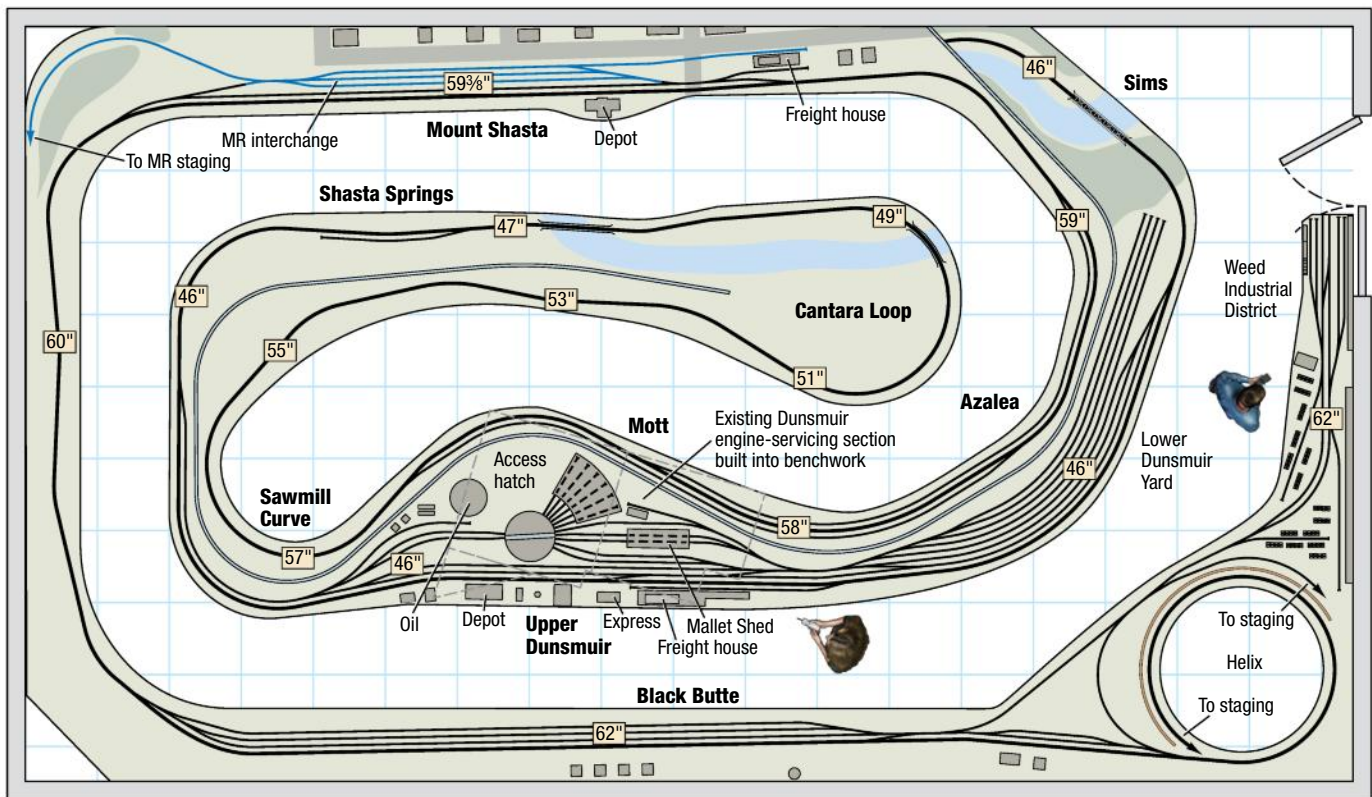
builder, and happily he thought that there was enough potential in the rough plan that we should work together on the design.

There was only one small problem: Unfortunately, I had remembered the as-built interior dimensions of the train room from our conversation incorrectly. The actual space was a couple of feet narrower than I thought! So we had to give up the aisle along which I had hoped to locate the high bridge scenes. And the overall smaller layout area caused us to jettison most of the McCloud River RR. Still, the as-built 21 x 37-foot area promised enough

room for plenty of layout – or so it seemed at first.

### The dilemma of Dunsmuir

As Southern Pacific fans know, the yard at Dunsmuir is actually multiple yards strung along a relatively narrow canyon carved out by the Sacramento River. The engine service and depot areas are in Dunsmuir proper, but a larger classification yard (“Lower Dunsmuir”) built in 1916 extends timetable west along the canyon about a half-mile below. Even in this substantial layout space, this was going to be a challenge.



## Southern Pacific's Shasta Division

HO scale (1:87.1)

Room size: 21 x 37 feet

Scale of plan:  $\frac{3}{4}$ " = 1'-0", 24" grid

Illustration by Byron Henderson and Rick Johnson

Find more plans online in the  
ModelRailroader.com Track Plan Database.

### The layout at a glance

**Name:** SP's Shasta Division

**Scale:** HO (1:87.1)

**Size:** 21 x 37 feet

**Prototype:** Southern Pacific,  
McCloud River RR

**Locale:** northern California

**Era:** 1950s

**Style:** walk-in

**Mainline run:** 210 feet (visible)

**Minimum radius:** 31" (main),  
24" (industrial)

**Minimum turnout:** no. 7 (main),  
no. 6 (yards/industries)

**Maximum grade:** 2.1 percent

**Train length:** 14 to 21 feet

**Benchwork:** open-grid, wall  
brackets

**Height:** 46" to 62"

**Roadbed:** cork

**Track:** flextrack, jig-built turnouts

**Scenery:** to be determined

**Control:** DCC

aisle space. Unfortunately, there wasn't room to include the machine shop and stores buildings across from the Mallet Shed. But these compromises allowed us to include the functions of both the yard and engine service terminal at Dunsmuir and still have room to model additional scenes.

### Starting at Sims

As mentioned, the visible layout begins with one of the Sacramento River bridges at Sims, Calif. Trains entering the layout here are eastward by timetable direction, SP defining "east" as moving away from San Francisco. There should be room for some convincing scenery modeling

here before entering the Lower Dunsmuir yard.

With the Lower and Upper Dunsmuir Yards overlapped, care was taken to ensure that one of the double-ended tracks can be used as a yard lead to switch Lower Dunsmuir without fouling passenger or other trains on the main lines. In a "works like" compromise, the tracks are reduced in number, and crossovers have been placed for functional utility rather than to replicate the appearance of the prototype track arrangement in Upper Dunsmuir.

In real life, the Sacramento River lapped perilously close to the back of the SP roundhouse. (This was one of



These two photos show the Cascade staging yard and, at the far end, the helix that connects this yard to the visible layout at Black Butte. The closer view of the helix shows the turntable (not shown on the plan) that Richard added to make it possible to turn locomotives for re-staging.

the reasons that a separate “Mallet Shed” was built – the roundhouse couldn’t be extended.) There wasn’t room to model this adequately in 3-D, but I was able to incorporate the builder’s section containing models of the turntable, roundhouse, and Mallet Shed. There will also be room to include models of many of the SP division point structures (not all shown on the track plan).

### And up the hill

From Dunsmuir trains climb past Shasta Springs, site of an earlier resort

and a siding that still received occasional tank cars for filling with the namesake spring’s outflow. Next we reach the prototype turnback loop at Cantara, where there once was a large sawmill. For the modeled era, perhaps some foundations or ruins would remain.

Shortly beyond, there’s another prototype turnback curve that is less well known: Sawmill Curve. Perhaps because it’s deep in heavy forest and not open as is the case with Cantara, it’s poorly documented in photographs. But it serves a very valuable purpose

on the layout, allowing track to curve around toward the lap sidings at Mott and Azalea. As on the prototype, the combined sidings in this area can allow three shorter trains to meet or pass or may be used to let a very long train (eastbound empties, perhaps) get by.

### Meeting the McCloud

The town of Mount Shasta was the interchange point for the SP with the lumber-oriented McCloud River RR. The track plan includes the major railroad-related structures, and there’s also room for a bit of the town to be modeled. The MR job arrives from hidden staging to swap cars with the SP via the interchange yard.

The SP continues timetable eastward, climbing to the junction point at Black Butte. Here the prototype railroad split into two lines to Oregon: the older Siskiyou Route to the (compass) west and the 1926 Cascade Route, which was built with less curvature and easier grades. The junction consists of a small yard and wye.

### Dealing with the wye

Junction wyes are an important part of real-life and model railroading, and the builder wanted all three legs of the wye to be active. As Mark Dance showed in MRP 2017, in N scale wyes can fit reasonably well with the typical benchwork and aisles of a model railroad. But in HO scale with fairly broad mainline curves, a fully active wye can be a challenge – especially if no-duck aisle access to the main lines is to be maintained.

One factor worked in my favor: This was to be the end of the visible layout, so trains via either the Siskiyou or Cascade routes would be descending to below-deck staging. So for the Cascade Route, the answer was straightforward: It could duck out of sight via a helix.

But the other disappearing route would be more problematic – because of the wye arrangement, trains would be spiraling in the opposite direction to descend that helix. While some folks have successfully built and operated such a counter-rotating helix, I felt that the location against the wall made access to the outer track a concern.

The large room was also an advantage, however: I had enough room to wrap the Siskiyou Route around the Cascade route helix only a partial turn and then descend on a long ramp along the wall to its staging yard. Any (rarely, it’s hoped) needed access could be from above from inside the helix.

## Learning points

- It's almost always worth trying a spiral peninsula benchwork footprint – especially if a real-life element (here the Cantara Loop) can plausibly form a visible turnback “blob.”
- Accuracy is often a trade-off between a scene that looks like the prototype versus elements that work like the prototype.
- Wyes active in all three directions are extremely challenging at broader radii in HO or larger scales. Sometimes a “sneak-off” route can help in which the track curves in the “wrong” direction after leaving the visible scene.
- Don't sketch too much before double-checking dimensions.

### Grown like a Weed

The one downside of this approach was that the wye didn't really look much like the prototype wye any longer. Fortunately, there was a bit of wall left, so I came up with a small industrial section representing some of the extensive lumber mills in the Weed area. So even though the Siskiyou Route main line was actually curving back surreptitiously, one leg of the wye visually diverged in the “proper” direction.

This industrial section also offered the builder some much-desired industrial switching operation that's pretty much lacking elsewhere on this prototype stretch. As can be seen in the track plan, this layout section will obstruct one of the double doors that swing into the building. So it will be built after the major benchwork construction elsewhere on the layout is completed, at which time that door won't be used.

### Staging through and through

Because there will be a large amount of open-top traffic on the layout (mostly lumber flats), through-style staging was desired for the SP to keep loaded and empty cars circulating in the proper directions. One advantage to modeling only one “side” of a grade is that one end of the layout will be high enough to provide excellent clearance for staging below (assuming room for a helix and/or ramp to reach it). Separate double-ended staging yards are provided for the Cascade and Siskiyou ends of the layout. Each of these connects with Sims at the other end of the visible layout.



Layout construction started with staging. Here one end of the Cascade staging yard is being laid out, with the McCloud River RR staging tracks roughly in place on the narrow shelf to the rear.



Richard's existing engine servicing terminal included the turntable, roundhouse, and Mallet Shed. Only a few tracks had been laid, so it was possible to incorporate this fairly large section into the benchwork at the appropriate angle.

The Siskiyou staging yard tracks are slightly shorter than those in the Cascade staging yard, but this reflects the different lengths of trains typical for SP operations over the two routes at the time. The staging yards also provide a continuous-running path for casual and display use.

McCloud River staging is made up of simple stub-ended tracks, so loads and empties would be manually swapped between sessions. The photos of the under-construction staging yards show a turntable added by the builder to turn steamers during restaging if desired (not shown in the track plan).

### Building on a conversation

A conversation at an NMRA convention and some productive windshield track-planning time provided the start of a model railroad design that echoes the prototype. Once built, the HO scale Shasta Division should provide both enjoyable railfanning and challenging operations. **MRP**

*Byron Henderson is a custom model railroad designer from San Jose, Calif. ([www.layoutvision.com](http://www.layoutvision.com)). He is also editor of the Layout Design SIG's ([www.ldsig.org](http://www.ldsig.org)) Layout Design Journal and a regular contributor to MRP.*

# The not-so-direct journey back to O scale



**I** The left end of David Barrow's 16-foot-long O scale layout has building mock-ups. The detail of ready-to-run models, including the Atlas O Electro-Motive Division GP7, is obvious, especially on an "in your face" O scale layout.

Noted HO scale modeler David Barrow tries his hand (again) in 1:48

**By David Barrow**//Photos by David Barrow III

**M**y current Santa Fe Plains Division Fourth Subdivision HO layout, which was shown in the August 2009 *Model Railroader*, is a 30 x 36-foot prototype model of the Atchison, Topeka & Santa Fe (ATSF) from Lubbock to Slaton, Texas, in the summer of 1977. The layout has been operationally finished for several years. It has a prototype track plan,

signals, a Traffic Control System machine copied from the original, and correct rolling stock and motive power.

The buildings are accurately scaled cardboard mock-ups, and the track is unpainted Atlas code 100 – what I call “representational” modeling. So how did all of this lead to an O scale switching layout?

A few years ago, I joined a chat group interested in prototype

modeling. A comment appeared that the code 100 track is an example of “prototype drift,” as more prototypically correct track is available.

I proposed an article to *Model Railroad Planning* about the current state of my layout with a list of what could be done to make it more prototypical. Editor Tony Koester suggested that readers might be more interested if I completed at least part of the work,



Slaton, Texas, is a familiar modeling subject for David. He modeled the yard on his HO scale Cat Mountain & Santa Fe, a 30 x 36-foot layout featured in the August 2009 issue of *Model Railroader* magazine. Tommy Holt photo



**2** This view in the opposite direction shows the other end of David's Santa Fe layout. Reaching in to uncouple cars or line switches isn't a problem, as the model railroad is only 2 feet deep. Since the layout is set in 1968, 40-foot boxcars could be seen operating with larger-capacity covered hoppers.

perhaps rebuilding some of the track with scale-size rail painted and ballasted along with some prototypical scenery to replace the representational scenery that I have now.

### Larger scale beckons

I started upgrading the HO model railroad by building layout sections with more prototypical details in a space downstairs from the existing layout. I planned to replace sections one at a time. But along the way it dawned on me that I could build an O scale switching layout in the same area instead.

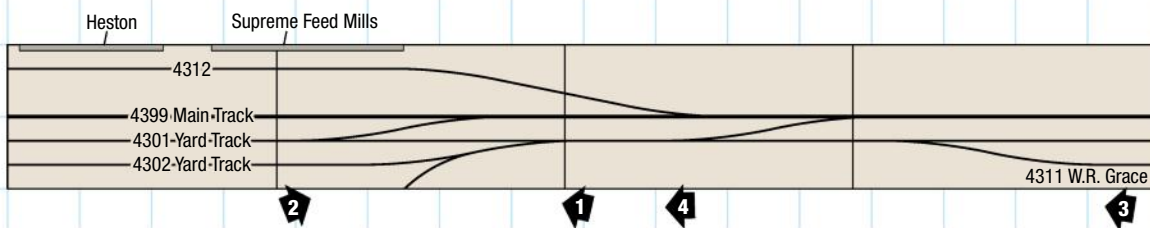
I wasn't a stranger to O scale. When I was in high school, I built a simple 10 x 20-foot O scale layout. I was also fortunate to visit with well-known ¼"-scale modelers who greatly

influenced me, Frank Ellison and Minton Cronkhite. Ellison built the Delta Lines layout and wrote the series "The art of model railroading" in *Model Railroader* in the 1940s. Cronkhite constructed the 2,940-square-foot Museum & Santa Fe layout at Chicago's Museum of Science & Industry, featured in the June 2003 MR.

My new 2 x 16-foot O scale layout has a prototype-based track plan greatly compressing the west end of Slaton Yard with room for only the main line, two yard tracks, and three industries. In Joe McMillan's *Warbonnets and Bluebonnets* (McMillan

Publications Inc., 2004), there's a picture of an ATSF GP7 in the "book-ends" blue-and-yellow scheme switching the west end on Oct. 15, 1968. That photo fixed my place and time, two important aspects of prototype modeling.

When I mentioned the project to my longtime friend Denny Taylor, who has been modeling in O scale for years, he immediately offered to send me the necessary rolling stock and help me find a model of a Santa Fe GP7 that Atlas O produced in 2008. John Urban painted the locomotive, and Riley Triggs added the electronics.



## Santa Fe's Slaton, Texas, Yard

O scale (1:48)

Layout size: 2 x 16 feet

Scale of plan:  $\frac{3}{8}$ " = 1'-0", 12" grid

Numbered arrows indicate photo locations

Illustrations by David Barrow and Rick Johnson

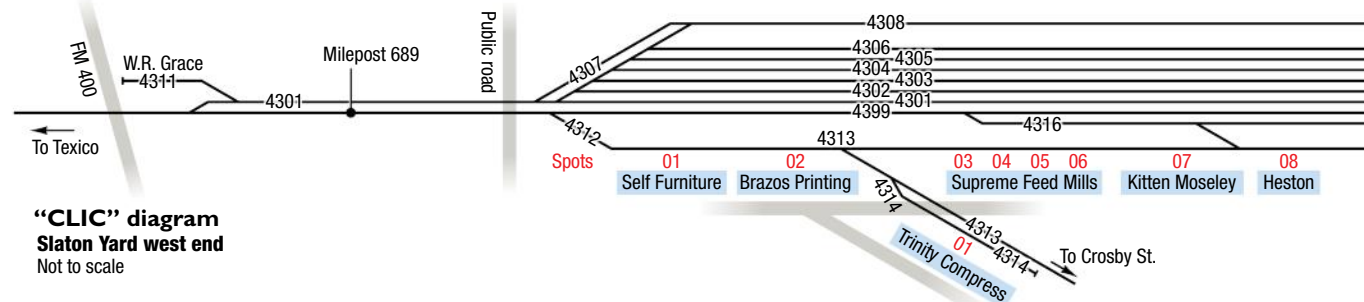
Find more plans online in the  
ModelRailroader.com Track Plan Database.  
Plan is viewed looking south



**3** A room on the lower floor of the two-story garage that also houses the HO layout upstairs was more than adequate to build an O scale switching layout.

### The layout at a glance

**Name:** Santa Fe in Slaton, Texas  
**Scale:** O (1:48)  
**Size:** 2 x 16 feet  
**Prototype:** Atchison, Topeka & Santa Fe  
**Locale:** Slaton, Texas  
**Era:** 1968  
**Style:** single deck  
**Mainline run:** not applicable  
**Minimum radius:** not applicable  
**Minimum turnout:** no. 5  
**Maximum grade:** none  
**Train length:** not applicable  
**Benchwork:**  $\frac{3}{4}$ " birch plywood  
**Height:** 54"  
**Roadbed:**  $\frac{1}{4}$ " birch plywood top  
**Track:** Atlas code 148  
**Scenery:** Woodland Scenics items  
**Backdrop:**  $\frac{1}{4}$ " birch plywood  
**Control:** CVP Products AirWire 900



**"CLIC" diagram**  
**Slaton Yard west end**  
 Not to scale

### O gauge or Proto:48

My first thought was to build the layout in Proto:48, a fine-scale version of O scale with the correct 4'-8 $\frac{1}{2}$ " gauge between the rails, as opposed to O gauge, which has rails spaced 5'-0" apart. I soon found out that although some products are available in P:48, I'd likely have to handlay the track and turnouts as well as change the wheel profile to prototype dimensions. [Proto:48 flextrack and other track components are available from O Scale Turnouts ([www.oscaleturnouts.com](http://www.oscaleturnouts.com)), Protocraft ([www.protocraft.com](http://www.protocraft.com)), and other sources. — Ed.]

I've long supported layout-building methods that use available products, skills, and spare time that anyone, including me, can reasonably be expected to have. I started by building in regular O scale and used ready-to-run track with Denny's equipment. The layout is small enough that I could rebuild it to P:48 standards if time and interest allow.

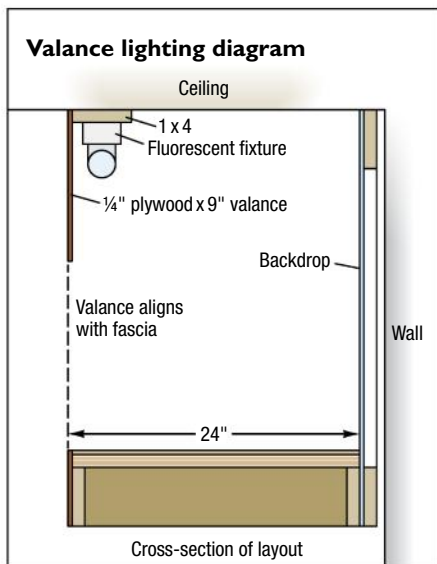
Although 4-foot-long benchwork sections were in place, I relocated the lighting over the front of the benchwork and installed backdrops, light valances, and cosmetic trim, as shown in the illustration on the opposite page.

The layout is currently complete using Atlas O's code 148 (.148"-high) track with no. 5 turnouts to compensate for the short length. I fastened the track in place over a couple of weeks using the same track nails through holes in the Atlas ties that I'd used in the HO layout upstairs.

O scale is easy to see and work on, and the larger size seems to jump out at you after being used to the smaller scale HO for years.

### Operation

I'm using CVP Products AirWire 900 battery-powered wireless control



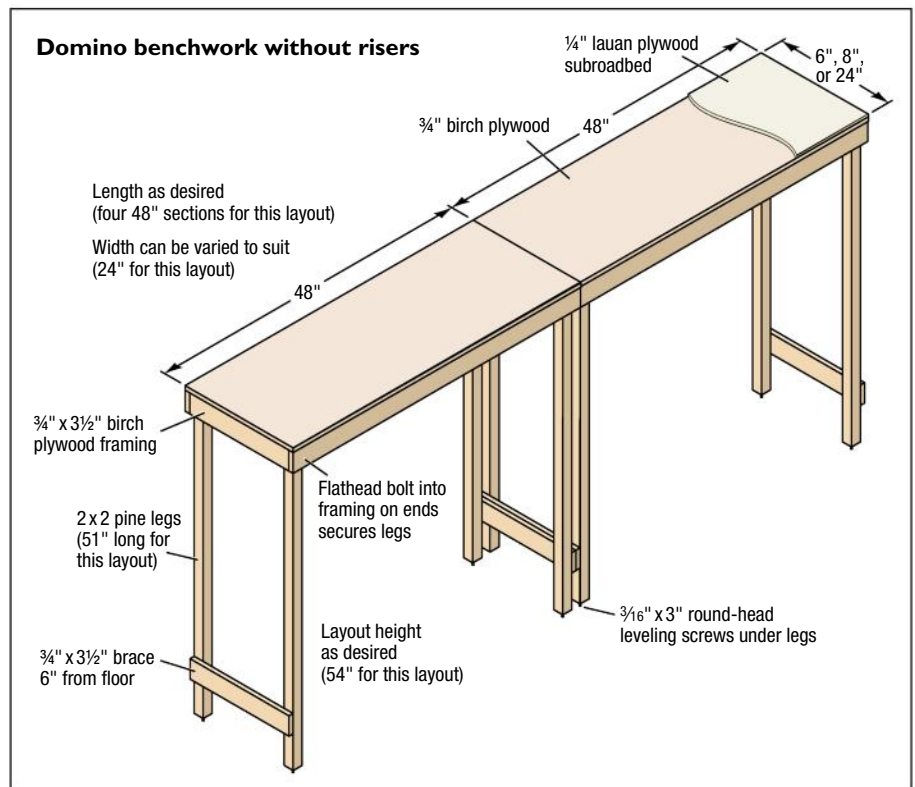
## Learning points

- An O scale switching layout easily fit into a space where HO layout sections were going to be built.
- Modeling in a larger scale provided new opportunities and challenges.
- O scale is "big" but manageable.
- Today's selection of detailed ready-to-run O scale models is excellent.
- Modeling in O fine-scale (Proto:48) is more realistic but also places greater requirements on the modeler.
- Battery power and radio throttles eliminated wiring.
- A higher level of detail can be added "tomorrow" as interest and time dictates.

system, so no wiring is necessary. Operation begins by reading the waybills inserted in the familiar type of car cards and then moving cars between the yard tracks and the industries. This can be made as simple or as complicated as desired by adding or imposing restrictions about when a car is required and at what spot, and when it can or can't be moved because it's being loaded or unloaded.

If this sounds too simple to maintain interest, I suggest reading professional layout builder Lance Mindheim's blog and books ([www.lancemindheim.com](http://www.lancemindheim.com)). He's been promoting simple prototype-based track plans and operation like this for years.

I'm having a fine time renewing my old interest in 1/4" scale. So what's next? Painting and ballasting the track? Building the industry flats? Change the



**4** The author standing beside the layout shows that its 54" elevation is a good compromise between reach-in ability and realistic viewing angles.

yard and industry tracks to code 125 or even code 100? (Although code 148 track looks large to me, it's apparently close to the 136-pound rail size on the Santa Fe main line at Slaton.) See what I can do with P:48? Or go back upstairs and start completing the HO list? It's good to have many options in our hobby!

Meanwhile, what I've done downstairs demonstrates that even in

O scale, prototype operation can be modeled in rather small spaces. **MRP**

*David Barrow has written extensively in Model Railroader and MRP about his HO scale railroad and his domino system of building layouts in standardized sections. You can read more about David's domino system in "Domino planning basics" in Model Railroad Planning 1999.*

I A pair of Canadian-built Wabash F7s trundles across the high bridge over Kettle Creek on Pierre Oliver's HO edition of the line between Detroit and Buffalo.



# Modeling the WABASH IN CANADA

The yard at St. Thomas, Ontario, forms the nucleus of this HO railroad

**By Pierre Oliver**

Model photos by the author and Trevor Marshall





**Wabash K-3 Mikado 2270 hustles an eastbound freight heading for Buffalo across the prototype of the towering Kettle Creek bridge in November 1940.** George Harris photo, Keith Sirman collection



**Wabash Fs 659 and 657 pause between runs at Fort Erie, Ontario, just across the Niagara River from Buffalo, N.Y., in September 1965.** This was just after the Wabash merged into the Norfolk & Western. Lacking a logical all-U.S. route, the Wabash got to Buffalo via Canada. Rich Taylor photo



**This pair of Fs is on the electrified London & Port Stanley, crossing the Wabash diamond in St. Thomas Yard in the summer of 1952.** This train has taken an extensive detour over the New York Central's Canada Southern line because of a car float operators' strike. Helmut Osterman collection

**S**t. Thomas, Ontario: Today, it's a small city in southwestern Ontario, struggling to cope with massive job losses as a result of the "new economy." Sixty-five years ago, it was a bustling railway center, home to three U.S. railroads as well as the two big Canadian railways and an interurban line.

One of the U.S. railroads was the Wabash. In 1898, the Wabash negotiated a running-rights agreement with the Grand Trunk Ry., predecessor to Canadian National, which remained in place until Wabash successor Norfolk Southern left Canada in 2006.

The Wabash operations in Canada are perfect to model for this freight car junkie. In essence, there were two separate operations. First was the "Redball" traffic: Hotshot through freights would transit the province, doing no work along the line. Perishables, priority freight, and parts for the auto plants in upper New York State made up the lion's share of the consists, complemented by the usual variety of freight traffic. These trains were essentially "sealed" at the border in Detroit and Windsor, and all cars had to be accounted for when they returned to the U.S. later in the day.

The other aspect was the more traditional activity. Daily way freights (locals) plied the main, a daily mixed train ventured forth, and there was a daily manifest freight that delivered and removed blocks of cars from the St. Thomas Yard. Oddly, the way freights and the mixed were shared jobs between the Wabash and Canadian National. For half the year, there would be a Wabash head-end crew and a CN tail-end crew, and for the other half of the year the assignments would flip.

Manifest No. 402 on the schedule was unique. While the train number indicated a CN manifest – the 400

# Wabash Cayuga Subdivision

HO scale (1:87.1)

Room size: 13'-0" x 40'-0" feet and 11'-0" x 21'-0"

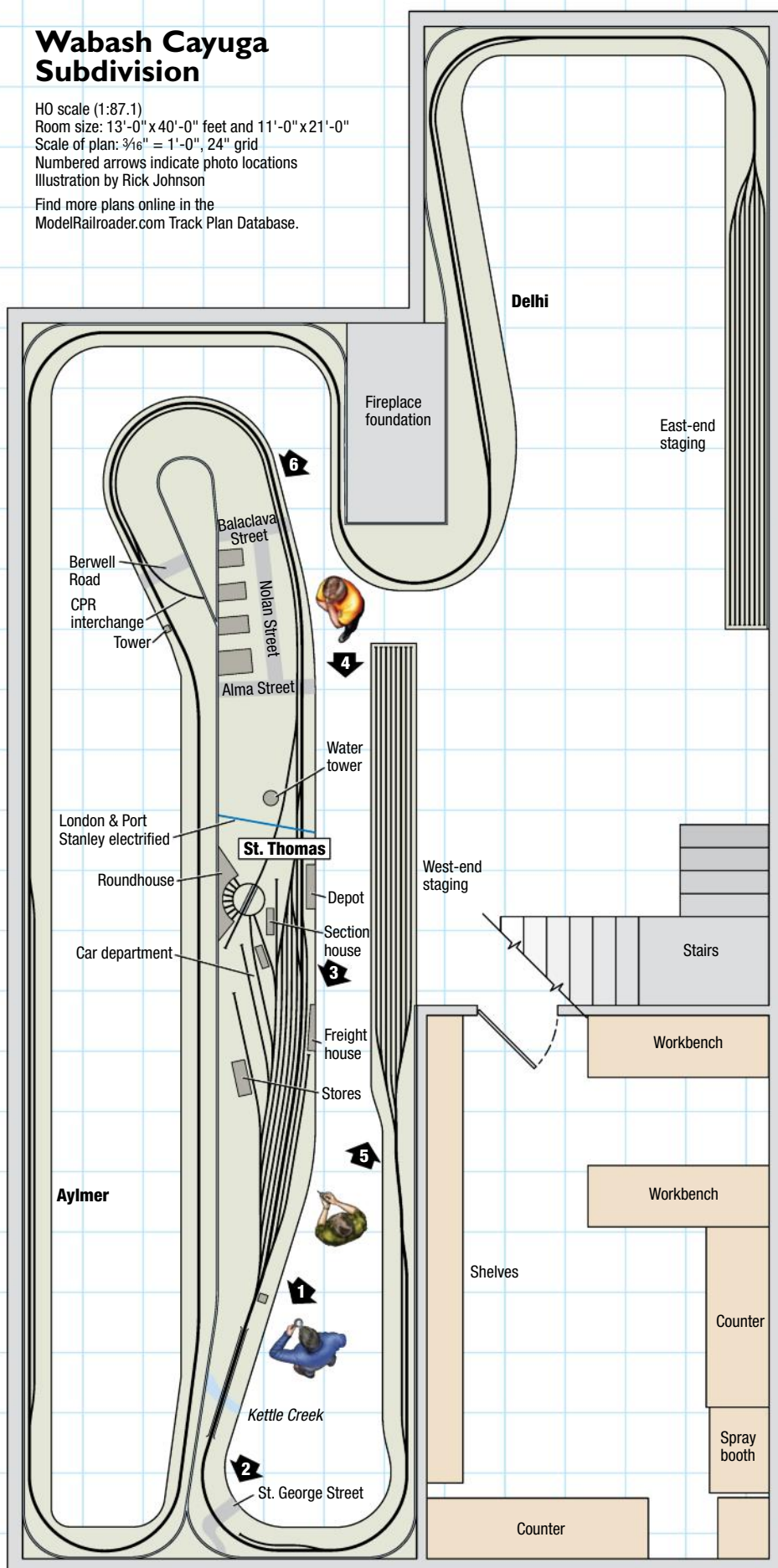
Scale of plan: 3/16" = 1'-0", 24" grid

Numbered arrows indicate photo locations

Illustration by Rick Johnson

Find more plans online in the

ModelRailroader.com Track Plan Database.



## The layout at a glance

**Name:** Wabash Cayuga Subdivision

**Scale:** HO (1:87.1)

**Size:** 13 x 41 feet and 11 x 21 feet

**Prototype:** Wabash Ontario lines

**Locale:** Ontario

**Era:** 1951

**Style:** linear walk-in

**Mainline run:** 200 feet

**Minimum radius:** 30"

**Minimum turnout:** no. 6 (main), no. 4 (industries)

**Maximum grade:** none

**Train length:** 13 feet

**Benchwork:** open grid

**Height:** 49"

**Roadbed:** 5/8" plywood plus 1/2" Homasote

**Track:** code 70

**Scenery:** Sculptamold over extruded-foam insulation board

**Backdrop:** .060" styrene

**Control:** Digitrax DCC



**2** After an eastbound freight enters the yard (top), a GE 43-tonner waiting on a stub siding at the west end of the Kettle Creek viaduct swaps cabooses.



**3** The freight shown crossing the Kettle Creek bridge is now entering the yard at St. Thomas. Cars for local delivery will be cut off and through cars switched on before it continues its run east to New York.

## Learning points

- Modeling a prototype facility close to home eases research.
- U.S. railroads operating in Canada offer unique modeling opportunities and challenges.
- A major yard can be the focal point of operations for the entire layout and provide a showcase for a prized freight car fleet.
- A slight shift in eras can ease the problem of finding available, accurate, and affordable motive power.

series was a prefix for most CN freights – the train was hauled from Windsor to Fort Erie and back by the Wabash. This arrangement was instigated by the two railroads in 1939, when Canada went to war against Nazi Germany and CN found its system overtaxed. As a result, one would see Wabash power and a caboose and a very Canadian-looking manifest train with 80 percent home-road cars and just a smattering of Canadian Pacific Ry. equipment.

The Redballs would have a more conventional appearance, with about 50 percent Wabash content and the balance reflecting the various roads that connected to the Wabash in



**4** To be sure everything would fit as planned, Pierre laid out the St. Thomas Yard on a strip of kraft paper.

Kansas City, St. Louis, Chicago, or Detroit. Most of the reefer blocks would be American Refrigerator Transit (ART), with Santa Fe Refrigerator Despatch (SFRD) coming in second, and just the occasional Pacific Fruit Express (PFE) reefer.

## Choosing a time frame

I've chosen the summer of 1951 as the time frame for my layout. My reasoning is simple: That was the year that the Wabash fully dieselized its Ontario operations. There are no commercial models of the Wabash K-1 and K-3 Mikados (2-8-2s) or J-class Pacifics (4-6-2s), so I'm following the



**5** West-end staging comprises eight stub-end (“muzzle-loading”) tracks that feed the west end of St. Thomas Yard. F7 A-A consists were typical; the Wabash used no B units in Canada.



**6** The yard at St. Thomas is shown in two stages of completion. The long Kettle Creek bridge is in the distance just before the curve to the left. Pierre handlays his turnouts using FastTracks jigs and tie strips.

prototype’s example with 10 pairs of EMD F7s and a quartet of SW8s.

The Wabash also had GE 43-tonner no. 51. Its main job was swapping cabooses for crew changes. “Tilley,” as it was called, would trundle out over the trestle in advance of a train’s arrival and head into the caboose pocket west of St. George Street. When the train had passed, it would do the caboose swap.

With the variety of traffic, I have a perfect platform to display my overly large collection of resin freight cars.

And the volume of traffic only contributes to this blessing. The timetable schedule only shows three eastbound and two westbound trains, along with No. 402, but there was sufficient capacity for up to 30 trains a day, an option that was exercised on more than a few occasions.

A review of old train orders, time books, etc., showed Canadian National dispatchers used multiple sections of scheduled eastward trains and extras for the additional westward traffic. It’s also known that the Wabash fourth

class trains were regularly given right over superior-by-class second and third class trains. Keep the Wabash moving was the watchword, a motto I’m enjoying bringing back to life in my basement not far from the former Wabash in St. Thomas, Ontario. **MRP**

*Pierre Oliver is the owner of Elgin Car Shops, a custom-building service for resin freight cars, and Yarmouth Model Works, which makes resin freight car kits and detail parts. He and his wife, Kate, live near St. Thomas, Ont.*



Tony Koester added a step along the westbound yard of his HO Nickel Plate Road to let yardmaster Jerry Albertie more easily reach the back tracks.

# 7 THINGS NOT TO DO

Mistakes we've made – and come to regret

**By Tony Koester**

Photos by the author

**W**e've all made mistakes when it comes to planning and building our model railroads. It's part of the learning process that makes the hobby enjoyable and challenging. But many of our errors could have been avoided if someone had cautioned us about the pitfalls that lie ahead. Much as we thought we knew what we were planning or doing, it often turns out that what we thought we knew wasn't quite the same as what we should have known.

So, at the risk of raising a few eyebrows and maybe even ruffling a few feathers, here are seven concerns that at least warrant further thought before you plunge ahead.

*Tony Koester is the editor of Model Railroad Planning and a contributing editor to Model Railroader.*

## I Building benchwork too low

**Paul Dolkos discusses** layout height beginning on page 52, so I won't spend much time on that topic here. But I've observed that most veteran modelers who range from around 5'-8" tall to well over 6 feet are building single-deck layouts in the 48" to 58" range. That's a great compromise between realistic views and being able to reach the nether parts of the benchwork.

I wrote "single deck" because such a narrow height range isn't practical when you're contemplating more than one deck. My multi-deck railroad has one main classification yard set at 43" off the floor, and that works well. The view of the yard isn't realistic, as it appears you're hovering over it in a helicopter. But it's a wide yard – too wide, truth be told – comprising both east- and westbound yards. That lower-than-optimum height for realism makes it easier to reach the tracks most distant from the aisle (see photo).

The other yard is at 68½", a nice viewing height for us 6-footers but impractical to work in. I therefore built a raised floor for the yardmaster and then a raised step for shorter crew members. They lower the effective height to 60¾" and 52¼", respectively, making it practical for shorter crew members to work in that 24"-deep yard.



In this photo from the early 2000s, Tony's grandson Jordan runs trains on the Nickel Plate with his sister Katelyn. An active model railroader, Jordan is now a 6-footer in college, so compromising the railroad's design to accommodate youngsters would have been at best a fleeting objective.

## 2 Building it for your kids or grandkids

**One of my grandchildren,** Jordan Koester, developed into a gung-ho model railroader. It was innate; from the time he was a toddler, Papa's trains were the focus of every visit. He's now a college junior and still as interested in trains as ever. He knows how to fire up and run my railroad as well as I do.

His dad, John, our youngest, and John's three siblings never developed an interest in model railroading. John later commented that if Digital Command Control (DCC) sound had been available in the 1970s when the Allegheny Midland was taking shape or the 1980s when it was fully operational, he might have jumped into the deep end of the pool.

The AM wasn't off limits to the kids, but neither were they encouraged to "play with Dad's trains." Those were expensive models, not toys, and they knew and respected that. One time John brought some friends into the railroad room and gave them a detailed briefing on the whole concept, including the "Look but don't touch" warning. He didn't know I was working under the benchwork; the hardboard skirting hid me. I was impressed that he had absorbed so much and clearly had developed a keen appreciation for what his dad was doing.

Should I have done something more to make the railroad more accommodating to the kids? I don't think so. Jordan "got it"; they didn't. All four kids were busy student athletes, and John and sister Sue went to college on basketball scholarships. They had their interests; I had mine. The railroad had very specific and narrowly defined goals, and realistic operation was at the top of the list. The models and the scenic setting were fragile. There was very little here for kids to play with. Had they expressed more interest, they would have received the same orientation and "do your homework" admonition I gave the regular crew members. I know some of you built your railroads partly or even primarily as a way for you to share your hobby with your children or grandchildren. I'm fully supportive of that as long as you didn't compromise your goals to meet the needs of little people who will all too soon grow up to be big people.



Jim Leighty (left), a builder, and Mike Quinn, a state trooper, work the local freight at Cayuga, Ind., on Tony's railroad. This requires keeping an eye on the timetable for superior trains while spotting and picking up cars as directed by the waybills. Developing these skill sets took time and effort.

## 3 Low-balling design or operation goals

**One of the biggest mistakes** you can make is listening to the least knowledgeable member of your building or operating crew when he or she complains about the degree of sophistication you're building into your railroad or its operating scheme. I admit that I have met groups of modelers who gather once a week at someone's house to run their railroad in a manner that would have me looking for a polite way out after an hour. But that isn't the norm.

There's always someone who simply doesn't want to add one more byte of information to his or her carbon-based memory. But that's not going to help you or your crew explore the almost endless possibilities realistic operation offers. It would be like playing Pick-Up Sticks instead of checkers, or checkers instead of chess, just because one person doesn't know how to play a more sophisticated game.

This is too often the case at model railroad clubs. The "old heads" don't want to be bothered with newfangled DCC or the expense and hassle of decoder installation. And who needs sound anyway? Then they wonder why membership keeps dropping off as the old timers fade away.

Finally, the young blood gets control of the club and instills new life – and DCC – into the mix. Suddenly, all sorts of operational possibilities come to the fore, as no one has to worry about keeping locomotives and entire trains in separate electrical blocks. Try using pushers in a direct-current (DC) block system, for example. Yes, it can be done, but why not use command-control technology to enhance your enjoyment by reducing the hassles?



Most curves on Tony's Allegheny Midland were of 30" radius, and Berkshires and Mikados managed it. But articulateds were restricted to 2-6-6-2s, as a larger 4-6-6-4 (right) had excessive overhang. Interestingly, 42"-radius curves fit in the same basement for his NKP layout.



Tests showed that diesel consists and weighted 2-8-4s and 2-6-6-2s could manage 30-car trains of empty hoppers up the 2.5-percent grades on the AM. What they didn't reveal was that locomotives sometimes surged going down those same grades with heavy, loaded hoppers.

## 4 Trying to get by with too-tight curves

**Simply put, just because** a locomotive or train can negotiate sharp curves doesn't mean you should plan on them. They will look better and operate more reliably if you take the manufacturer's stated minimum radius and multiply that by 150 percent: 27" instead of 18", for example – or at least 24".

Same for turnout number: I'd avoid no. 4s like the plague. No. 5s are better, no. 6s will handle most situations, and no. 8s on crossovers, which are essentially S curves, are a very good idea.

Yes, you can get by with tight curves and sharp turnouts on a small switching layout. But don't aim from the outset for such limitations. Example: I decided in advance that 30" curves and no. 6 turnouts would be a good minimum on the Allegheny Midland. I was guessing, as it was the first large layout I'd built.

Those requirements worked OK, although my 2-8-4s and 2-6-6-2s looked a bit odd negotiating those curves and turnouts, and a brass 2-6-6-6 or 4-6-6-4 refused to play the game. I quickly learned that no. 6 crossovers enjoyed derailing passenger trains and longer freight cars – not always, but often enough to become really annoying. There's nothing more problematic and mood-spoiling during an operating session than frequent derailments.

Before Frank Hodina and I designed my current steam-era railroad, I repeated some tests Bill Darnaby had made with his 4-8-2s only using my 2-8-4s. My results echoed his: Those engines looked best on curves of at least 42" radius. I also standardized on no. 8s for all mainline turnouts.

Now here's the interesting part: Those 42" curves fit nicely in the same basement that previously had accommodated only 30" curves. Lesson: Be careful what you aim at, as you may hit it. And aim high.

## 5 Ditto for too-steep grades

**I ran some tests** with the motive power and train length that I planned to run on the AM. I discovered that heavily weighted brass Berkshires and Mallets would pull about 30 empty hoppers up the target 2.5 percent grades.

Only after the railroad was in operation did I discover that I'd just barely dodged a bullet. I hadn't worried about how many loaded hoppers those same engines would pull, as it was downgrade all the way from the mines. Many of those engines had enough slack in their gearboxes to surge when I tried to run longer trains. Backing off to the 30-car design goal solved the problem. Had I built, say, 3 percent grades, I would have had to have the gearboxes reworked or replaced.

Today's engines usually have better mechanical innards, but many of us still run locomotives imported back in the 1980s or even the 1960s. Lesson: Test your motive power to be sure it will do its job before you build anything more than a test grade that includes your minimum-radius curve.

### Learning points

- Accept the fact that making mistakes is part of the process of designing and building a model railroad. Grow from them, and don't let a lack of knowledge slow progress on your railroad.
- Don't let the least-capable or -knowledgeable member(s) of your crew determine the quality of the work or the level of sophistication of your control system or operating scheme.
- Don't compromise your goals to meet the needs of grandkids or youngsters who will grow up all too soon.
- Test locomotives and equipment to make sure it can handle a maximum grade and minimum curve radius before building the layout.
- Maintain high standards during layout construction, including using high-quality benchwork materials and following good wiring practices to avoid problems later.



Tony prefers to use  $\frac{3}{4}$ " cabinet-grade birch plywood for subroadbed that's then overlaid with  $\frac{1}{2}$ " Homasote roadbed. He supports the subroadbed every 16" with risers to ensure against sags that would be difficult to remove after the scenery goes in.

## 6 Under-building benchwork

**You've probably heard** my standard reply when someone asks me why I used  $\frac{3}{4}$ " plywood for my subroadbed: "Because I couldn't find any 1" plywood." Yet I still find modelers, who as a whole are perennial penny-pinchers, proudly proclaim that they got by with  $\frac{5}{8}$ " or even  $\frac{1}{2}$ " plywood.

Would they also be proud that they found some below-specs concrete or used concrete blocks and built their home's foundation out of them? The subroadbed, be it plywood, spline, foam, or whatever, is indeed the foundation of the railroad. It's also the part that you least want to have problems with, as it can't later be replaced. Yes, you probably will get by with  $\frac{5}{8}$ " plywood, but I found that some AC-grade plywood supported on 24" centers sagged noticeably over time. It was in a hidden staging yard, so I shimmed it up and "got by."

The mistake there was not having the supporting risers on 16" centers, but imagine the result had I used thinner plywood. Lesson: Buying good materials is almost always worth the extra cost. In fact, following veteran modeler (and architect) David Barrow's advice, for my current layout I used  $\frac{3}{4}$ " furniture-grade birch plywood for subroadbed. It has proven to be an excellent investment.



Using color-coded wire of an appropriate diameter is a good way to avoid wiring errors and to track them down when they inevitably occur. The convention is red insulation for the front bus and black insulation for the bus farther from the aisle. Tony runs a green feeder to power his frogs.

## 7 Using any available wire

**Even with the simple wiring** needed for a DCC layout, it pays to use wire of the proper gauge and color-code. Bus wires should have red or black insulation ("black in back" – that is, the black bus powers the rail farthest from the aisle). Bus wires of at least 14AWG are ideal; I use 10AWG solid wire. The feeders between the buses and rail should also be red and black to sort out the confusion when – not if – you miswire a section of track.

I use 3M brand (only!) insulation-displacement connectors ("suitcases") to connect the feeders to the bus, but not directly. Rather, the wire tied to the bus is used as a short pigtail to which six or so feeders are connected with a properly sized wire nut. For feeders, I use 18AWG solid wire and flatten the end attached to the rail to resemble a spike head. I use silver-bearing solder to attach the feeder to the rail. I solder the feeders on the side of the rail away from the aisle to hide them from view. The joint won't interfere with flanges if you do a neat job and file away any excess solder. Every length of rail gets its own feeder. Where I overlooked a rail, it later became dead, as rail joiners aren't reliable electrical conductors.

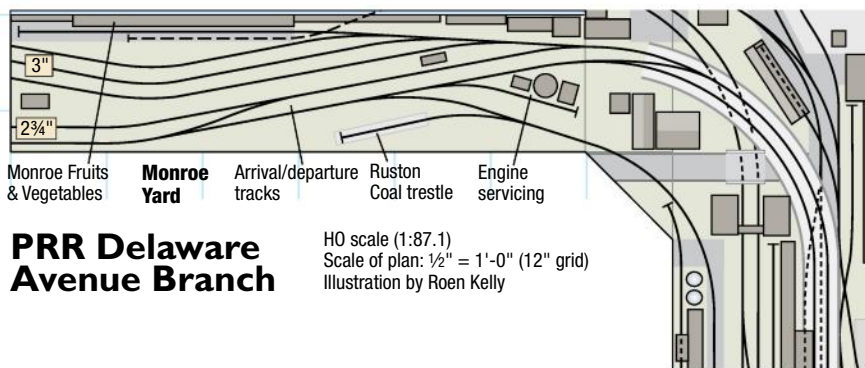
Some modelers use a short length of 22AWG or so wire as a drop between the rail and feeder. I like to minimize the number of connections between wires and hence don't recommend that. **MRP**



The Tar Branch is the subject of a four-part series in *Model Railroader*, starting with the January 2018 issue. It was also documented in a series on *Model Railroader Video Plus* (MRVideoPlus.com) and was the featured story for MRP 2017.

### Modeling memories

Congratulations on the variety of modeling information you put together in *Model Railroad Planning 2017*. I read with interest editor Tony Koester's comments in "Modeling from a model" on why overseas modelers choose to model the railroads of North America.



### PRR Delaware Avenue Branch

HO scale (1:87.1)  
Scale of plan: 1/2" = 1'-0" (12" grid)  
Illustration by Roen Kelly

A revision of Bill Neale's track plan in MRP 2017 ("A sectional urban switching district") shows double track extending to the end of Monroe Yard.

Personally, I'm modeling my memories: some of my earliest are of traveling from Toledo, Ohio, to New York City with my parents as a young child. In 1951, after 18 months of working in the U.S., my father decided to return to England – and so I feel equally at home modeling railways from both sides of the Atlantic.

I think it's Tony's third point that makes U.S. railroads most attractive: the enjoyment of freight interchange between railroads and putting it into

operation on a layout. I've been closely following the Tar Branch features on *Model Railroader Video Plus*, and it's very inspiring.

*Ian Wilson, Corby Glen,  
Lincolnshire, U.K.*

### Missing track

I tend to pay close attention to innovative track plans, and the one highlighted in "A sectional urban switching district" by Bill Neale was especially intriguing. But did something happen when the author's plan was redrawn? The first switchback tail out of the staging area, just to the left of the "slide," seems awfully short for a five-car train.

*Dominic Bourgeois, Montreal*

[Good catch, Dominic! The accompanying segment of the plan, above, clears up the problem. The double track off the viaduct should have continued all the way to the end of Monroe Yard. That allows an easy runaround in the yard and plenty of tail space to work the whole train down the slide. – Bill Neale]

### Having fun

The latest MRP was perhaps the best since I started reading the annual in 1998. MRP continues to provide needed insight and help to significantly improve key aspects of the hobby.

I particularly liked Tom Bailey's article ["Adding traction to a steam layout"]. My own efforts on a joint Illinois Terminal-Wabash layout don't qualify as an "addition" of traction, but rather as an integrated overall concept from the beginning. Subsequent planning refinements have taken place over the last 10 years as the track plan has solidified and construction progressed. But the bottom line is that I'm having a lot of fun.

*Gene Carpenter, Monticello, Ill.*

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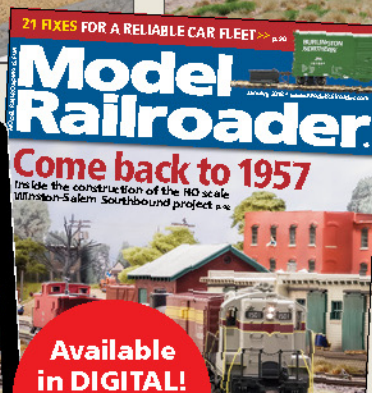
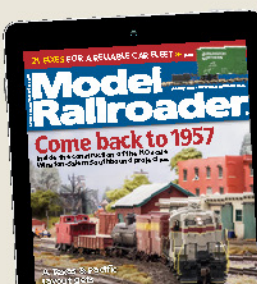
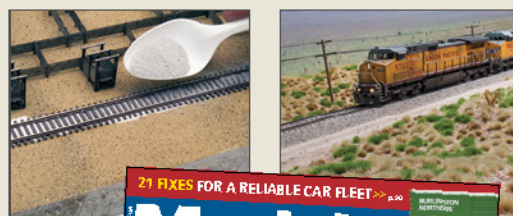
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In this single photo, one can readily discern several reasons to build a model railroad, such as friends having a good time and re-creating scenes from a favorite prototype. Here (from left) Glenn Glasstetter, Mike Evans, and Bill Badger work way freights on Randy Laframboise's and Mike Sparks' HO tribute to the Rutland Road.

# Why we build model railroads

It's like choosing a favorite color

By Tony Koester//Photo by Randy Laframboise

**There are probably** as many reasons to build model railroads as there are model railroaders. But there is obviously a lot of common ground.

The basis for the hobby is building models, but to what end? Some of us enjoy building finely crafted miniatures. Others enjoy seeing miniature trains put through their paces. Still others favor the construction of realistic scenery. In most cases, those interests overlap.

Another aspect of our broad-shouldered hobby is social in nature. We enjoy getting together with friends on a regular basis to share our railroads. Such gatherings are often called “oper-

ating sessions,” and the idea is to have fun while emulating the operational procedures found on the full-size railroads to which our models pay tribute.

When our model railroads are closely based on specific prototypes in every practical respect, they serve as windows to the past. How else can we revisit what happened back in, say, the steam-to-diesel transition era?

And so it is in the accompanying photo taken on Randy Laframboise and Mike Sparks' HO homage to the Rutland RR (see *Model Railroad Planning 2016*, page 68). The Rutland ceased operations in 1961 following a lengthy strike,

although portions of it live on today under the Vermont Ry. banner. But the Rutland-Burlington section has been resurrected in Randy's ample basement, and it serves as a time machine that allows Randy, Mike, and their crew to travel back to the early 1950s on a regular basis.

Having a model railroad also provides the excuse to gather together like-minded individuals who enjoy socializing – obviously, the rules are a bit more relaxed than on the prototype – while celebrating an important aspect of New England's storied and colorful past. **MRP**



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