Layout design element

Modeling UP's in N scale

It was time for a new railroad to realize new objectives

By Daryl Kruse//Photos by the author

Geneva Sub

1. In the model and prototype (inset) photos, the railfan viewing platform built by the city of Rochelle, Ill., is visible to the right of the diamonds where the Union Pacific (ex-Chicago & North Western) crosses the BNSF.

One hundred and twenty-five miles of Class 1 double-track main line is a lot to model in a basement, even in N scale. Veteran model railroaders would advise against such ambition, but a modeler wants what he wants. I wanted my next layout to include the Union Pacific main line in the Chicago area, with a big yard, several river crossings, the Global III intermodal facility, and the Rochelle, Ill., diamonds.

Choosing locations

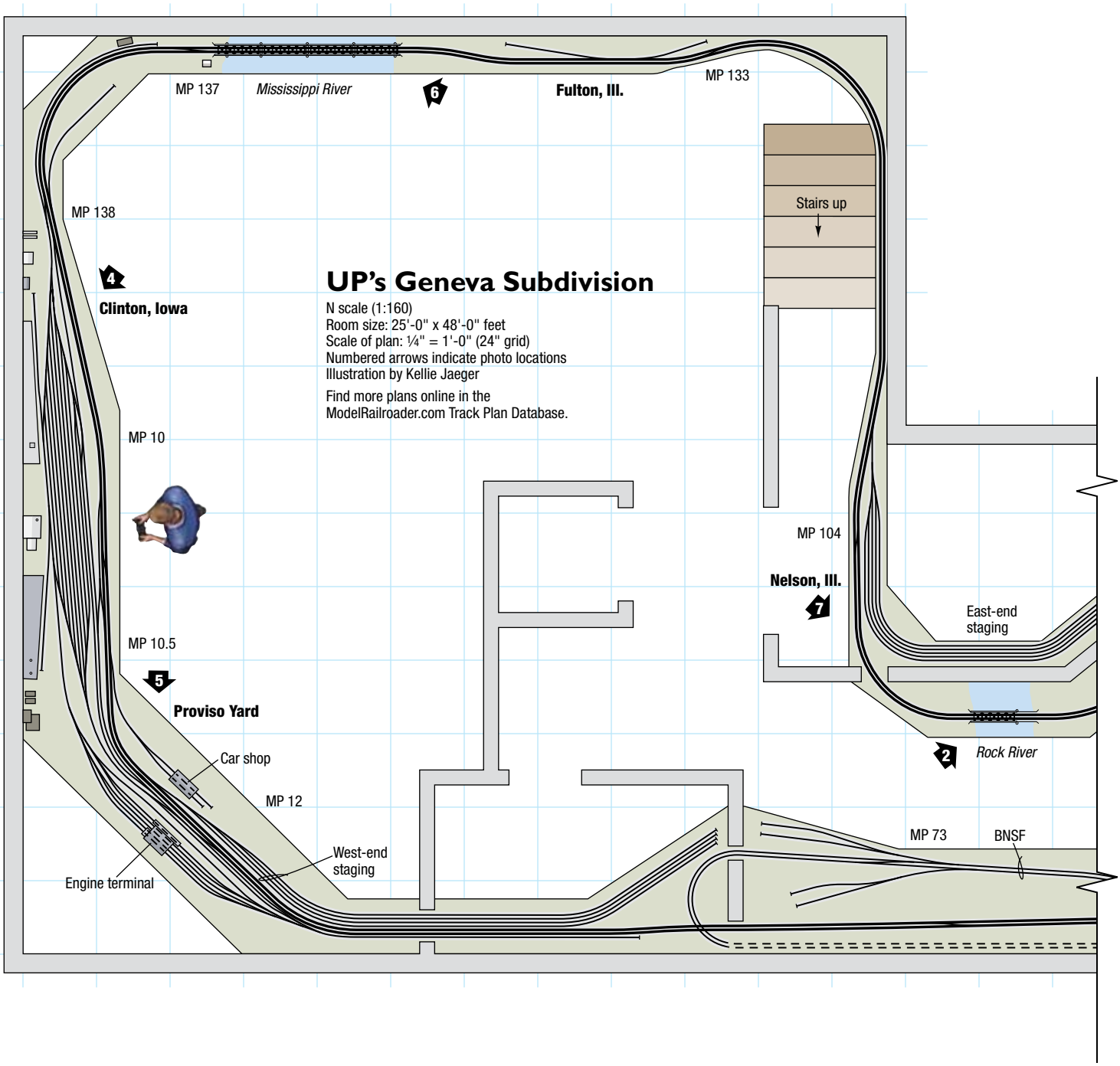
The former Chicago & North Western's Proviso Yard in the Chicago suburb of Berwyn is the definition of a big-time yard. For a major river crossing, there's none better than the Mississippi River bridge from Illinois into Clinton, Iowa, which has three spans, one of which rotates. Between these features lie the busy double-track main line, more river crossings, the UP Global III intermodal facility, and the Rochelle diamonds.

There are a lot of other features along those 125 miles that weren't going to fit in my basement. One challenge was to model the features I wanted while leaving out many others without destroying the integrity of the railroad.

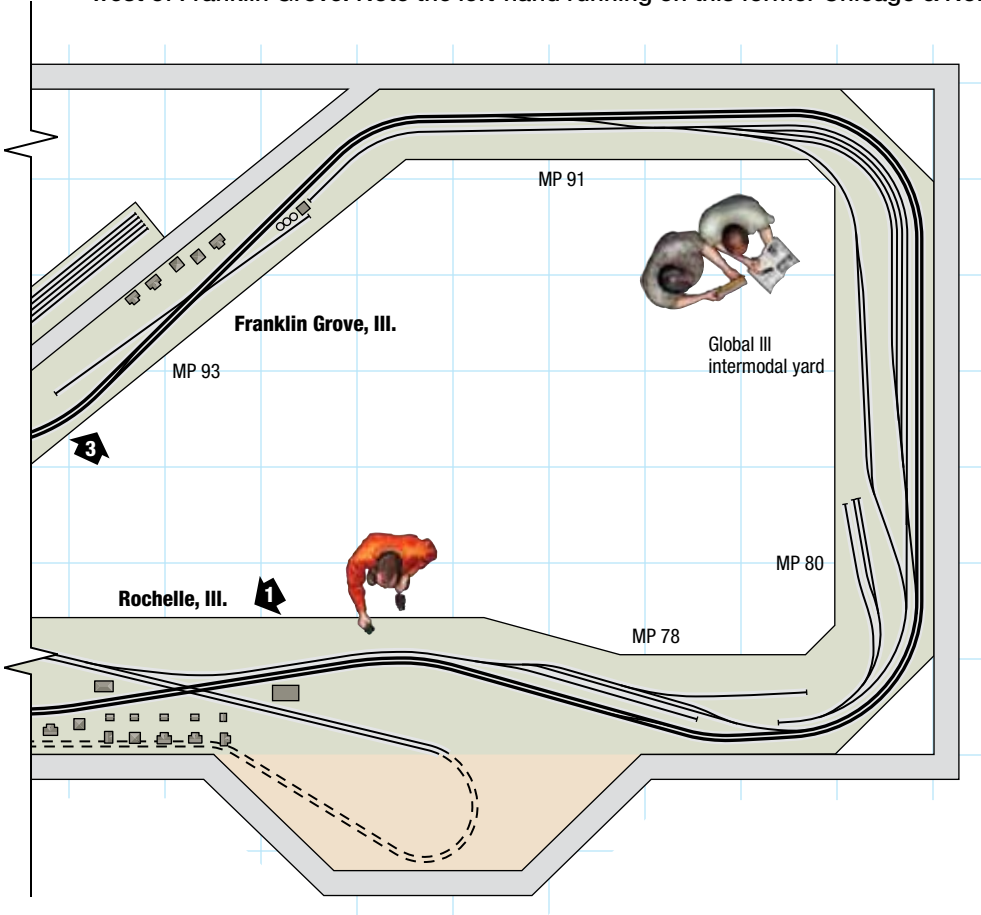
Construction objectives

Tearing down my existing Union Pacific Rochelle Subdivision [See the November 2008 *Model Railroader. – Ed.*] didn't make sense to a lot of people. But there were many things that I thought could be done better. The list of improvements includes:

- double-track main line elevated a prototypical 30" above grade
- no. 10 mainline turnouts, no. 8 elsewhere
- 36" minimum-radius mainline curves
- elimination of peninsulas and turnback curves



2. Daryl built the Geneva Sub's double-track main to model busy traffic, such as this meet at the Rock River Bridge just west of Franklin Grove. Note the left-hand running on this former Chicago & North Western line.



The layout at a glance

Name: Union Pacific Geneva Subdivision
Scale: N (1:160)
Size: 25'-0" x 48'-0"
Prototype: UP (ex-C&NW)
Locale: northern Illinois
Era: 2007
Style: single deck
Mainline run: 153 feet
Minimum radius: 36"
Minimum turnout: no. 10 (main), no. 8 (elsewhere)
Maximum grade: none
Train length: 15 feet
Benchwork: open grid
Height: 55"
Roadbed: cork
Track: Micro Engineering code 55
Scenery: plaster on screen wire
Backdrop: 2 x 50-foot sections of plastic roof flashing
Control: Digitrax Digital Command Control

3. Eastbound and westbound trains wait in Franklin Grove while a high-priority westbound stack train snakes between them. Who said double-track railroading was strictly follow-the-leader?

- Midwest river crossings
- layout height of 55"
- prototypical signaling

Although I considered incorporating the improvements into the existing Rochelle Sub, I eventually realized the only way get it all in properly was to start from scratch.

The basement is divided into four separate rooms – two large finished areas and two smaller unfinished rooms. For the main line to loop around the basement's perimeter while avoiding the need for duckunders, it would need to go through all four rooms. I needed to find a way to handle the room-to-room movements.

I designed the track plan so the time trains spend in the two unfinished rooms represents the areas of the prototype Geneva Sub not represented on the layout. Traveling east to west, the layout begins at Proviso Yard, then enters the first unfinished room. The time a train spends traveling through this room represents the missing mileage between Proviso and Rochelle. The unfinished room is also used to allow the BNSF line to loop back into Rochelle (more on that later).

The line reappears on the other side of the unfinished room in Rochelle. Overpasses will be used to disguise the holes where the main line passes from Proviso into the unfinished room and from the unfinished room into Rochelle. In Rochelle, the overpass will represent I-39, which crosses over both the UP and BNSF main lines on the eastern edge of the city. I devoted 2'-6" by 20'-0" of layout space to Rochelle.

From Rochelle, the line travels past the Global III intermodal yard located just west of town. The prototype yard is huge, covering 100 acres of land. The modeled yard is greatly scaled down, but it still occupies 2'-6" by 14'-0" of layout space.

From the intermodal yard, the main line enters Franklin Grove, Ill. There will be two industries in Franklin Grove with the turnouts for the two sidings facing in opposite directions, which should keep switching crews busy. From Franklin Grove, the main line crosses the Rock River and then enters the second unfinished (furnace) room, where there is a staging yard and a minimal representation of Nelson, Ill.

At first glance, the prototype in Nelson looks like not much more than a small yard in the middle of nowhere. However, Nelson is the junction of the UP's Peoria Subdivision, which goes all the way to the coal mines of southern Illinois, with the Geneva Subdivision. From Nelson, the line pokes through a hole in the stairs, runs on a narrow ledge along the wall, and enters the western Illinois town of Fulton.

The section of track along the stairs represents the missing mileage between Nelson and Fulton, which lies along the Mississippi River. Fulton will also have two yet-to-be-determined industries. From there, the main line crosses the Mississippi River and enters the Clinton, Iowa, yard.

Two yards in one

Although Proviso and Clinton yards are 125 miles apart in real life, they will actually be one yard on the layout. From a modeling standpoint, the yard will be heavily Proviso, with that yard's engine facilities, car shops, yard tower, office, and warehouses. Clinton's Thomas & Betts facility, however, will be modeled on the far eastern side of the yard.

From an operational standpoint, UP trains arriving eastbound into the yard or departing westbound will be arriving and departing Proviso. But UP trains arriving westbound into the yard or departing eastbound will be arriving and departing Clinton. Operations at the Proviso/Clinton yard will keep three operators busy handling incoming and departing trains, hostling locomotives, sorting cars, building trains, and delivering cars to industries.

Operations on the Geneva Sub

The overall design of my N scale rendition of the UP's Geneva Subdivision is geared toward operation. One thing that sets apart operation on the Geneva Sub from many other model railroads is the double-track main line. Instead of a single-track main line with numerous passing sidings, the Geneva Sub, like the prototype, is double-tracked end to end. The main line is more than 150 feet long with nine crossovers.

The crossovers alternate back and forth (north track to south track, south to north). This is a departure from the prototype, which normally has them in pairs so at each point, trains can go from either track to the other. I considered doing this on my layout, but I wanted to use no. 10 turnouts on the main line. A pair of crossovers

4. A Norfolk Southern stack train gets ready to depart eastbound from Proviso Yard, while a loaded UP coal train continues on the main to a Chicago-area power plant.

using four no. 10s ate up too much main line.

You might think having a double-track main line would eliminate interesting train meets and the puzzle solving both dispatcher and engineers engage in, especially in the timetable and train-order era. But train meets are still an important aspect of operation on a double-track main as trains moving in opposite directions cope with a third train picking up and setting out cars at industries along the line. The challenge is still there, but with even more possibilities for creative dispatching solutions.

Staging yards

As on the prototype, a large variety of trains travels across the N scale Geneva Subdivision. Trains originate and terminate at the west-end staging yard, east-end staging yard, or the combined Proviso/Clinton yard. I wanted to avoid having a train both begin and end a run at the Proviso/Clinton yard. So trains that originate

5. An earlier photo shows the construction at Proviso Yard as a long train of auto racks pulls into the arrival track. The engine terminal is in the right background, the car shop on the left.

6. An eastbound coal train and a westbound manifest freight cross over the Mississippi River bridge between Fulton, Ill., and Clinton, Iowa. Daryl's use of a photo backdrop will preclude modeling the highway suspension bridge. The inset photo shows a westbound autorack train at the prototype location.

there always end in staging without re-entering the Proviso/Clinton Yard.

With the Proviso/Clinton yard serving as both the starting point and ending point of the main line, the staging yards are set up a bit differently. The west staging yard is straightforward, as it's located next to the yard and represents Iowa and points west.

I could not fit the east staging yard adjacent to the yard, so I put it in the furnace room next to Nelson. East staging represents CSX, Norfolk Southern, other Chicago UP yards, the Peoria Sub, and points east.

Trains from the west staging yard simply run through Clinton and are then on their way across the Geneva Sub, but train movements from the east are a bit more complicated. Most trains from the east staging yard must "cheat," as they pass through Fulton on their way to the Proviso yard.

I toyed with the idea of putting a track behind the backdrop in this area so the trains would not be seen until they appeared by Proviso Yard, but I don't like hidden track. I would rather see a train "cheat" than wait for it to suddenly appear from hidden track. So westbound trains start at the east staging yards and travel to Proviso before continuing across the subdivision. Two trains each day – one NS and one CSX – stop on an arrival track and uncouple their power. UP power from the Proviso engine facilities couples up to the train, and the train then continues its run westbound across the Geneva Sub. There is a holding track at Proviso that CSX and NS locos can use to wait until they are needed to take eastbound trains back to the east staging yard.

On the prototype there would be a crew change as well as a motive power change, but on the N scale Geneva Sub, the same crew stays with the train. The change from CSX/NS to UP at Proviso definitely adds interest to running trains. Similarly, some eastbound trains that don't terminate at Proviso must switch over from UP motive power to CSX/NS before continuing east to the staging yard.

Coal train operations

Special consideration is given to coal train operations on the Geneva Sub. I have a set of 40 empty coal cars and a set of 40 loaded cars. Since empties should always move westbound and loads eastbound, coal train operations were not a simple matter of running from staging yard to staging yard and back again. Some system was needed to get the coal trains from place to place while always moving in the same direction on the layout.

I found a number of videos on YouTube that showed UP coal trains in the Chicago area being backed up to get from the UP main to non-UP tracks so the coal cars could then be taken to their destination.

I also researched the junction between the Peoria and Geneva Subdivisions in Nelson. I learned the Peoria Subdivision runs all the way down to southern Illinois, where the UP serves coal mines in the area.

Learning points

- When an existing layout no longer satisfies one's objectives, it may be time to dismantle it and begin anew.
- A well-defined list of objectives will keep the project on track.
- Even a large model railroad will require leaving out a lot of the prototype's physical features.
- Don't be intimidated by walls.
- The lack of peninsulas eliminates turnback curves and opens up the center area.
- Crossovers allow a double-track railroad to support interesting train movements.
- "Cheating" on train routings may be offset by the elimination of hidden track.

7. Eastbound and westbound trains pass under the coaling tower in Nelson, Ill. A photo of the concrete coaling tower disguises the hole in the backdrop that separates Nelson from Franklin Grove.

The empties start the day in the east-end staging yard and run from there to Proviso, cross the subdivision, and end up in the west-end staging yard. Later in the day, the empties become a different train, back out of the west-end staging yard, and run as empties from Proviso headed to Nelson and the Peoria Sub on their way back to the southern Illinois coal mines.

At Nelson, the coal train again backs into the east-end staging yard, representing a movement from the Geneva Sub to the Peoria Sub. The empties are now in position for the next day's operating session.

The loaded coal train runs the opposite route. The loads start in the west-end staging yard, run eastward across the main line to Proviso, and then make their way to the east-end staging yard. Later in the day, the loads represent coal from southern Illinois. UP motive power back the loads out of the east-end staging yard at Nelson, a movement from the Peoria Sub to the Geneva Sub. The train then moves eastbound to Proviso, where the train is backed into the west-end staging yard and is now ready for the next operating session.

BNSF too!

One great addition to the Geneva Subdivision is not part of the subdivision at all. Instead, it is BNSF track used by the railroad's switcher and allows run-through BNSF trains. At the Rochelle diamonds, the layout continues straight past the bay-window indentation. This created two feet of space behind the layout, which allows the BNSF track to do a turnaround behind the backdrop, continue behind a view block, and then do another turnaround in the bathroom to complete the loop. This will allow periodic BNSF trains to run across the diamonds and add to the operational interest of the layout.

Operating sessions

An operating session on the layout keeps up to 14 people busy running trains, working the yards, dispatching, and switching industries. This includes a crew of two or three at the Proviso/Clinton yard, two people at the intermodal yard, one person for the BNSF, a dispatcher, and four to seven people running the 17 trains of each 4-hour operating session. A general superintendent – me – oversees the operation. I sometimes operate the layout solo, which provides a lot of relaxation and fun and helps me keep the layout in top operating condition.

Progress report

The UP Geneva Subdivision you see in the accompanying photos is three years into construction. All benchwork, track, and wiring are complete. Scenery, structures, and detailing are just getting under way. The railroad is completed to the point where operating sessions can take place.

The new layout employs open-grid benchwork with screen wire and plaster scenery. Track is laid on ⅜" plywood with cork roadbed. The main line has an extra 1/16" sheet of cork under the ⅛" inch N scale roadbed to put the total thickness of roadbed at 30 scale inches, which is more in line with Class 1 mainline track. Yards and other secondary track have ⅛" cork roadbed, and industrial sidings have no cork. Turnouts, all 113 of them, are handlaid using Fast Tracks jigs, powered with Tortoise by Circuitron switch motors and controlled with DCC stationary decoders.

The old Rochelle Sub was a lot of fun to operate, but operations on the new Geneva Sub really shine. Trains run flawlessly and look great flowing through the no. 10 turnouts and 36"-radius or greater curves. The lack of peninsulas provides wide-open areas for operators to move about. This allows everyone to watch the fun even when they're not running a train and encourages conversation and fellowship among those in attendance.

But as much as I enjoy operating sessions, for me most of the fun comes from planning and building the layout. The UP Geneva Subdivision has provided me with plenty of both for the past three years and will likely continue to do so for many more years to come. **MRP**

Daryl and his wife, Patricia, are both educators at St. Paul Lutheran School in Rochelle, Ill. They have four grown children and three grandchildren. An N scale model railroader since 1970, Daryl also enjoys working with computers, playing tennis, and most of all, spending time with his grandchildren.