

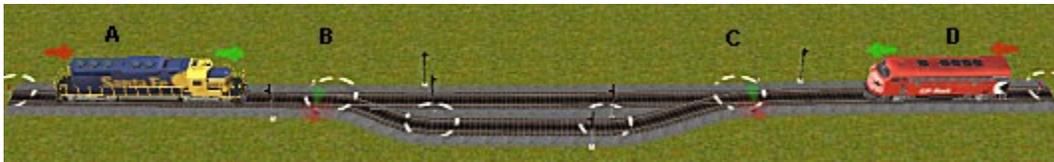
Part 5 - Working With Signals

There has been a lot of discussion on the forum pages about the correct way to place signals. I don't want to duplicate that dialog here. Instead I'd like briefly demonstrate one known problem, then show what works for me. Hopefully you'll find something that will help your situation.

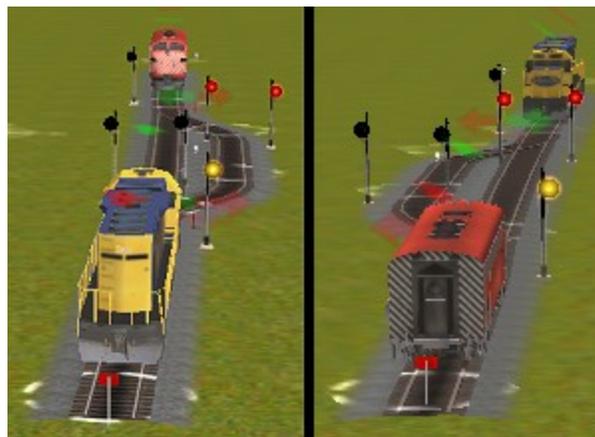
Some folks on the forum have suggested that because the game's signal programming can only look one or two blocks ahead, it doesn't always work the way you might expect. As a result, you have to make a choice: You can either place signals so they control trains correctly, or you can place signals in a prototypical way. Some choice, eh? :-)

Cornfield Meets

This problem is especially evident if your mainline is single track. If you're going to operate trains in both directions on a single track, you have the potential for them to meet head-on. Consider the following drawing:

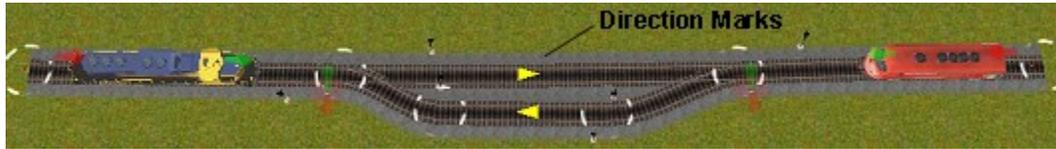


Here you have two trains, at A and D. Between them is the pass track from B to C. Notice that the switches at both ends of the pass track are set for the mainline track. Since the track from B to C is empty, both trains see a yellow signal, allowing them to pass the signal at restricted speed.



If both trains pass their respective signals at same time, they can enter the mainline track between B and C simultaneously, resulting in a "cornfield meet."

One solution to this problem, although not a very prototypical one, is use directional arrows to force trains from one direction onto the sidetrack. In the drawing below, trains approaching from the left always take the mainline and trains approaching from the right are forced into the pass track—even if no other train is present.



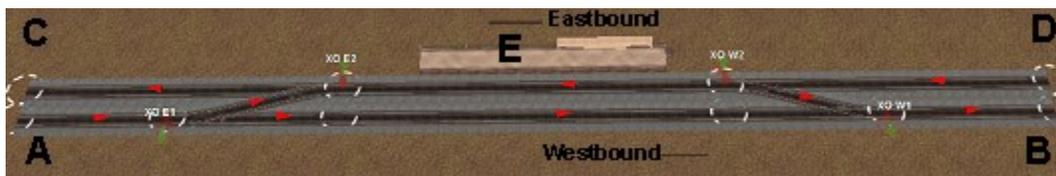
This would prevent cornfield meets, but it's not a very prototypical way to do it.

If you are emulating a real-world railroad and you make the decision to duplicate that road's single track line, expect to have problems if you run more than a few AI trains. As noted above, several folks on the forum have suggested alternate signaling arrangements, which, although not necessarily prototypical, help to keep your trains apart. Check other posts on the forum for further information.

Dealing with AI issues

On my own Midwest Central, I knew that the road would be quite busy with AI trains, so I talked my board of directors into funding a double track mainline. That simplified matters greatly, since east and westbound trains each have their own track and cornfield meets are less likely. In that situation, it's not unusual to have ten AI trains operating at the same time. But there are still potential problems at chokepoints such as crossovers, stations and industry sidings, especially if AI trains are to enter those places.

Here's one example:

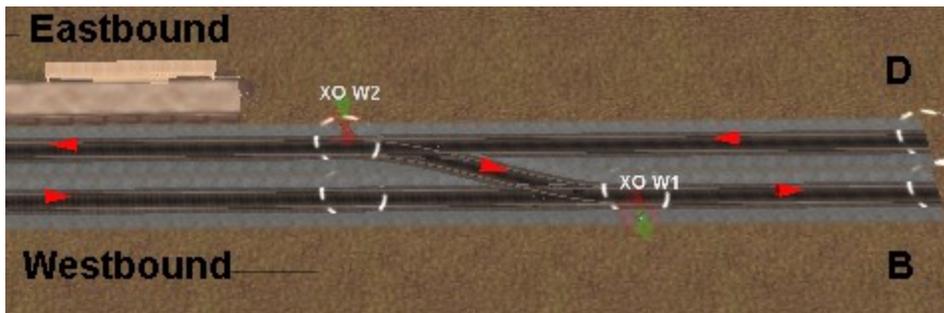


Here we have a double track mainline, with westbound trains running from A to B and eastbound trains running from D to C. We have a station on the eastbound side, at E. Let's take closer look:



Above is the left half of the picture. You can see the red track marks, indicating the track direction. The crossover E1/E2 allows westbound traffic into the station. Notice the crossover track is laid left to right, because that is the expected direction westbound trains will take when they enter the station.

Here's the other side of the drawing:



Again, track marks show the track alignment, and notice how the W2/W1 crossover track is also laid left to right, since westbound trains leaving the station will follow that path to reach the westbound mainline to continue their journey.

Now some of you might be saying, "What's to prevent westbound trains from going to D rather than B?" Good question. We have to use directional arrows, like this:



There are now two yellow directional arrows. The left one, on the E1/E2 crossover, permits travel only in the westbound direction through the crossover. This allows westbound trains to reach the station, but prevents eastbound trains from changing to the wrong track.

Once a westbound train has entered the station, we have to force it to return to the westbound main after leaving the station. That's the purpose of the second yellow arrow, on eastbound main to the left of D. This arrow allows eastbound trains to

pass, but blocks westbound trains, effectively forcing them to take the W2/W1 crossover to continue west.

Okay, you say, if a train is heading directly from A to B, what's to prevent it from taking a little detour through the station, blocking eastbound traffic in the process? The answer is: you cannot prevent it.

Here we have arrived at one of the great frustrations of Surveyor: The AI sometimes directs trains to take the wrong path for no apparent reason. Any time you have an alternate path from one point another, there is a good chance that a random AI train will take that path. You can set up and run test trains and they work fine, but when you start a session, sooner or later, usually when you have one train closely following another, the following train will take a path you don't want it to.

Some people have suggested that a solution to the problem is to place a track mark on the track opposite the station, like this.

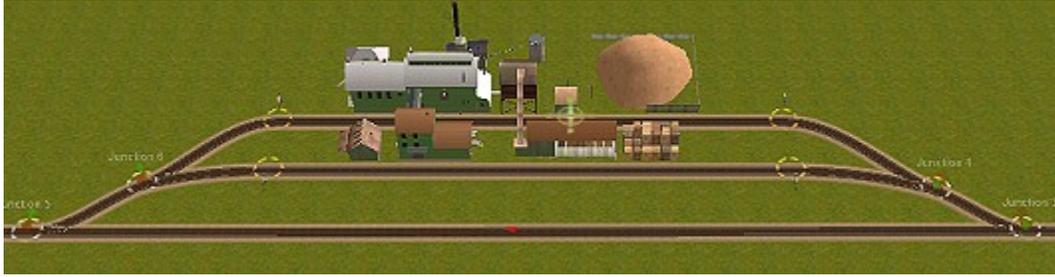


You then issue a 'Drive via track mark...' command, thereby forcing the train to bypass the station.

This method is okay, but as I see it there are two problems. The first is you are then required to put a bypass track mark on every potential problem to keep trains on the right track. Doing so adds to the complication of train schedules and increases the chance of scheduling errors.

Secondly, and a bigger problem, if the bypass track mark is blocked for any reason, such as by another train, a following train will detour through the station anyway, AND when it reaches the westbound track again, it then will attempt to back up to reach the track mark. What a mess. 😊

A similar potential problem exists whenever you have a trackside industry, such as a lumber mill or a power station. Consider the following:



Above is a Pulp Mill, situated just off the mainline track at the bottom of the picture. As I mentioned in the last section, AI trains will occasionally travel through the industry, instead of staying on the mainline like they're supposed to. The only workaround you have is to place a track mark on the mainline and tell the train to travel via the track mark.

But suppose there is already a train on the mainline opposite the mill when a second train approaches. With no other alternative, the second train takes the alternate path, through the industry. Once it regains the mainline, however, the train is still scheduled to go to the track mark. It stops on the mainline and begins to back up, trying to reach the track mark. Given that situation, it's almost better to forget the track mark and let the train go through the industry. At least it will get back on schedule once it regains the mainline. (sigh)

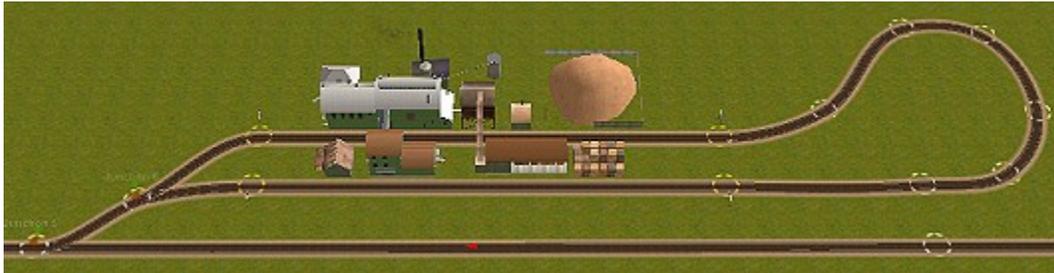
Editorial comment: All the nice features that Auron adds to the game from time to time are cool and all that. But I would gladly give up some of the frills in exchange for an AI that works right. I have spent many, *many* hours and have re-laid countless sections of track trying to work around problems with the AI. I probably spend thirty percent of my Surveyor time trying to solve AI-related problems. Love the game, but...

Okay, enough of the rant, but if you are a new surveyor and have places where trains can choose more than one path to a destination, get used to the fact that, sooner or later, they will.

One thing you can do to minimize the problem is to limit your industry access to a single entrance, preventing the AI from seeing an alternate path. Instead of our original drawing, try this:



In the arrangement above, mainline trains that approach from the right have to back into the industry. Trains approaching from the left go in head-first, but can use the switch at the far right to 'run around' the train and couple to the rear if necessary to head back to the left. An alternate arrangement, if space and budget permit, is to provide a reverse loop to the right of the industry, like this:

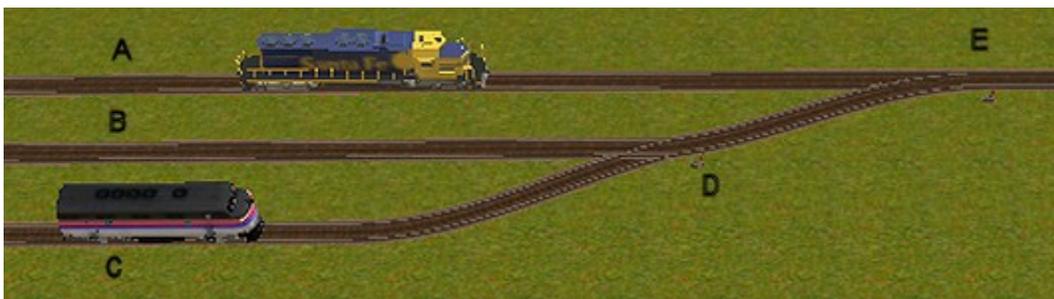


In this setup, trains still enter the mill in the same way, but they have a choice to use the loop to get them going in the right direction once they leave. For example, trains approaching from the left can either use the turnaround if heading back to the left, or they can back out and continue to the right. The loop works particularly well with AI trains, since no switching is required.

The bottom line: Limiting the number of alternate paths on your road will go a long way toward minimizing traffic tie-ups.

Working with signal blocks

In working with signals, I've discovered that it's helpful to think of signals as devices that make a train stop. That sounds simple enough, but here's the point: Don't put a signal anyplace you *don't* want the train to stop. Here's an example:



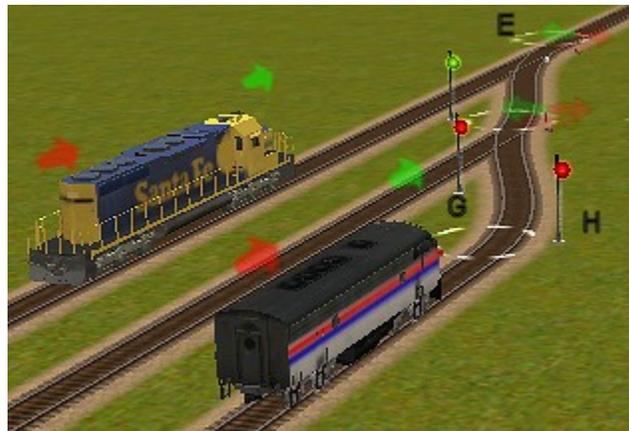
In this example, the AI SD40 on track A wants to go to track B. At the same time, the AI F7 on track C wants to get to the mainline. Let's assume that the mainline track A is one-way, from left to right. How do we signal these tracks to let both trains accomplish their goals?

Some might suggest we place the signals near the mainline switch, with signal F serving to isolate the industrial area from the mainline, as shown below:



There's a problem with this arrangement, though. If the mainline switch is set for the SD40, as shown above, then the SD40 can advance past the signal and stop, ready to enter the industrial area. That part's okay. But placing the industry-area signal at F allows the F7 to advance to that signal, thereby blocking the SD40 from entering. Get the idea?

What we have to do is place signals so that the F7 stays where it is until the SD40 has reached track B:



With the signals at G and H, the F7 cannot proceed as long as the switch at E is set for the mainline. Even if the E switch is facing the industrial area, the F7 still cannot proceed if the track beyond E is occupied.

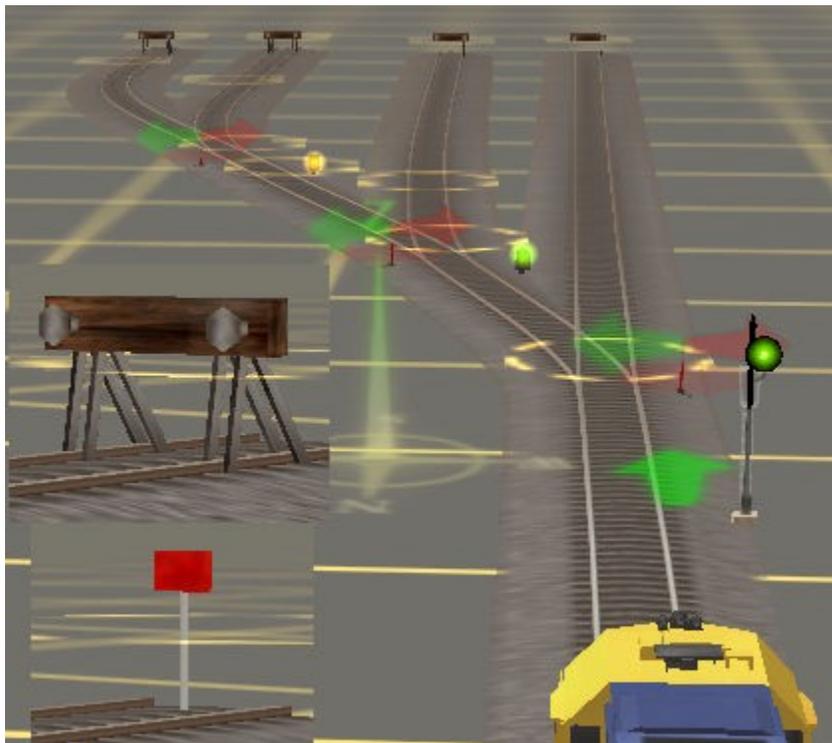
Perhaps it will help to think of the track from G/H to E as an 'isolation zone'. Only one train at a time is permitted in it. Note, however, that the isolation zone must also include the track beyond E. Why? Because a train to the right of E blocks the F7 from leaving; and we cannot permit the F7 to move toward the mainline until it has a clear path.

at J and another train is approaching from the right, they'll meet at J and end up in a standoff.

In situations like this, it's always good to run some test trains to see how the game will handle it.

A note on sidetracks

If you have single-ended sidetracks--sidetracks you can only reach from one end--you have to place an 'end of track' marker at the end of each one. If you don't, you'll get a 'line terminates' message on the entrance signal. Check out the drawing below:



In the drawing notice that there's a brown marker at the end of each sidetrack. The two inset frames show a closeup of it and one similar. These are 'signal rail ends' and 'signal end of track' from the USA. You can use either one, or one that's appropriate for your road or region. Note that these 'signals' have a direction, just like the track. Make sure they face toward the incoming traffic. If they don't, you can rotate them.

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