

**East to West on the**  
**Upper Midwest Transportation Corporation**

**Mainline**

Final version, June 29, 2003

General conventions. Several drawings are included in this description. One drawing is a schematic of space with major benchwork features labeled. Three others present the scale drawings of each of the three decks. There also are several 3D representations of the layout space, which include some other draft details just for a better image of what the final layout will look like. On the scale plan drawings, elevations (inches) are marked throughout. Hidden tracks are gray. Visible tracks are black. The staging level is considered complete with all sidings and scenes identified. On the other two levels the drawing presents only the mainline routing along with approximate positions of passing sidings. Many other details on the middle and upper decks will need to be added later. The grid size is 1 foot. Track standards include minimum mainline radius of 30" except for branchlines and helix cut-off tracks, where the minimum radius is 24". Where the main goes through the curved leg of a turnout, the minimum turnout number is 6. Number 8's are used for crossovers on the main. The letters A-D indicate four halves of the two peninsulas (see schematic diagram). The two peninsulas are referred to as Pmaj and Pmin. The layout has two helices, one atop the other. Both are double track to avoid having the helix dictate rate of flow around the layout.

General The layout represents a single-track main running east and west between Chicago (hidden staging) and some point in the prairie countryside west of the Twin Cities. The mainline functions as point to point (staging to staging). A single large yard (St. Paul) is on the middle deck. At least one other major train destination should be designed into the middle or upper decks later. Continuous loops also are designed for railfan-type running. There are continuous loops on each of the staging and middle decks. There also is a loop-to-loop continuous run that extends across all three decks. Two branchlines, one attaching to St. Paul trackage on the middle deck and one attaching to a western point on the upper deck, consist mainly of Free-mo modules, which will be mostly or entirely built and owned by individual members. The lowest deck is Wisconsin. The middle deck is Twin Cities and points close to it to the west. The upper deck is wide-open prairie, Minnesota or Dakotas or points similar.

Staging This deck consists of a hidden staging yard – the easternmost point of the layout – and visible tracks representing rural Wisconsin. We begin our trip up the UMTC main in eastern staging (perhaps a train originating in Chicago), which is at position A on Pmaj on the staging deck. The train is pointing upwards on the drawing. The yard uses a split ladder design to maximize long parking tracks. This yard will be constructed with #6 turnouts on one side of the main and #5 turnouts on the other. We will then experiment with club equipment to evaluate the suitability of #5 turnouts in yard ladders in general.

If not suitable, this staging yard will be converted to all #6s and the #5s will be recycled elsewhere in the layout or sold. Leaving the yard, the train emerges and passes a siding representing a creamery or other dairy industry. The scenery is rolling hillsides with grazing cows and farms. Around the end of the peninsula, as we enter B the scenery becomes forested. This area is an abandoned farm that is in re-growth, and it has recently been converted to a nature preserve. The train will “disappear” in spots into the forest. The benchwork at the end of the peninsula will be open, so that hills and creeks below track level can be modeled. To the casual full-height observer standing straight up, the main will duck below the deck above around this curve. It will be easily visible by bending over a little. We then enter a small, RR-oriented little town where the UMTC main crosses and interchanges with the WC. The interchange track is the helix by-pass in disguise, as the WC crosses the UMTC main at a double diamond before disappearing into the background. Also, the WC main is involved in the turnaround loop on this level, used only for casual, non-operations, railfan running. For operation running, interchange traffic is spotted on the double-ended siding closest to the aisle. This town also has several UMTC-served industries and a passenger station for Amtrak service. The turnaround opportunities in this town are somewhat stingy, increasing the complexity of local switching. This town is all easily visible from the aisle. Small, cosmetic grade changes are on the main on the peninsula end. Staging and the town are flat at 32” height. After passing the Wisconsin town our westbound train enters the helix and wraps around several turns before re-entering at “A” on Pmaj on the middle deck.

### Middle

Scene A on this deck is a big double-ladder yard in St. Paul, very similar to Pigs Eye. (A very rough draft is visible on the 3D views, but this yard design needs to be resolved later). Two turnouts off the main indicate the yard entrances. A branchline to the Free-mo’s on the door wall crosses over the main. We’ll leave the fun of how to construct this yard for later, but the classification tracks will have a little curve to them and a big engine service facility complete with turntable and roundhouse will be on the peninsula end. Our westbound train is a run-through and it passes by the St. Paul yard, observing local slow speed limits. The B side is still Twin Cities but now we’re in Minneapolis. The details of the scene are to be determined later, but this would be a good spot for another Amtrak depot among other things. We’ve lost a little elevation as we wrap around and head up C on Pmin, having disappeared a short bit to hide the fact that the train has just completely turned back on itself in space. The sidings between the two peninsulas are there to be sure we get the aisle geometry correct; other sidings and switching details will be added in other locations later. All of Pmin on this deck would represent countryside or towns a short distance west of the Twin Cities. Again, we save those details for later. In transitioning from C to D, we gain elevation at a 1.6% grade, pass back over the main and head towards the helix. There is a continuous run, helix by-pass track on this deck. Elevations on this by-pass are a little tricky; it takes a 2.3% grade to lose enough elevation to get back to yard level.

### Upper

The helix to get between middle and upper is shorter than the lower helix. In contrast to the constricted, shelf-like appearance of the rest of the layout, the upper deck will have a very open feel, possibly without using any backdrops at all, just separating scenes on the opposite sides of the peninsulas with small hills. There will be some switching on this deck, but not much, considering how high it is off the floor. Scenery is western prairie: farms, grasslands, hay fields, basically far western Minnesota, or Dakota-like. Here trains open up the throttle and we watch them cruise at near eye-level height. Wrapping around the four scenes in the order D-A, the train then curves up the door wall and enters the west staging yard, where track spacing is a generous 2.5" in deference to this yard's height off the floor. Elevation of this yard has tentatively been set at 65", balancing the need to have sufficient elevation separation from the Free-mos at 50" track height with the need to be able to get trains on and off the track without breaking them. Each of A, B, C and D on the upper deck could represent separate towns or maybe one or more should just be wide open. At least one passenger station should be up on this deck too.

### Notes on helices

Lower. The grade is 2.0%. Railhead-to-railhead elevation separation is 4 3/16 inches.

Upper. As drawn, the grade is 1.6% and the elevation separation is only 3 7/32", which is fairly tight. Pending further construction considerations, small elevation adjustments might be needed to get the tracks on the upper helix further apart than that. This can be done with minor reworking of elevations of track in and out of the helix. Though no changes to routing will be needed, some elevations may need to change slightly (about one or two inches).

### Distances

Layout Piece	Inches	Scale miles
Staging deck, yard to lower helix entrance (including staging track)	550	0.76
Lower helix, outer track	698	0.96
Middle deck, lower helix entrance to upper helix entrance	1075	1.48
Upper helix, outer track	321	0.44
Upper deck, upper helix entrance to staging (including staging track)	1454	1.97
Total	4098	5.63

## Track Standards

Standards in force in the June 29 plan.

## UMN RR Layout Standards

	Minimum radius (inches)	Track size (Code)	Minimum turnout number (single)	Minimum turnout number (crossover)	Minimum turnout number (ladder track)	Minimum track centers (inches)	S curve minimum straightaway (inches) <sup>*****</sup>	Max. grade, train-length stretches	Max. grade on short stretches	Minimum vertical clearance (inches) <sup>***</sup>	Normal vertical clearance (inches) <sup>***</sup>
<b>Main line, visible</b>	30	83 6*	8*	X	2	12	1.6	1.6	3.5	4.00	
<b>Main line, hidden</b>	30 100 or	83 6*	8*	X	2	12	1.6	1.6	3.5	4.00	
<b>Helix cut off tracks</b>	28	83 6*	8*	X	2	12	1.6	1.6	3.5	4.00	
<b>Branch line</b>	24	83 5	X	X	2	7	1.6	2.0	3.5	4.00	
<b>Industry tracks</b>	18 55 or	70 4	4	4	2	6	X	7.0	4	4.00	
<b>Freight yard</b>	36 55 or	70 4	5	5	2	6	0	0	X	X	
<b>Freight yard switching leads</b>	30 55 or	70 6	X	5	X	X	0	0	X	X	
<b>Staging</b>	30 100 or	83 5	5	5	2	12	0	X	8	8.00	
<b>Helix</b>	30 100 or	83 X	X	X	2	X	2.1	X	3.75	3.75	

\*Required where mainline goes through curved leg of turnout; recommended elsewhere.

\*\*2.5 on upper deck

\*\*\*Railhead to railhead

\*\*\*\*Not every entry was used in the June 12 plan

\*\*\*\*\*Some shifts using flexible turnouts will be used to gain this distance

Written and Submitted by Bob Sterner on behalf the layout planning committee (Nate Schutte, Andy Inserra, and Bob).

June 12, 2003.