

BNSF Railway

Fall River Division

Layout Design and Operations Overview



John Parker

Front Range Division, March 2026



www.bnsfrr.net

<https://www.facebook.com/Fallriverdiv/>

It's Great To Be Here!

- **Qualifications & Disclaimer**
- **Layout Overview**
- **Prototype vs. Freelance Choices**
- **Layout Design**
- **Operations**
- **Q&A – Ask!**



What YEAR was the Burlington Northern and Santa Fe Railway Formed?

“The Burlington Northern and Santa Fe Railway was formed on September 22, 1995, when Burlington Northern Inc. acquired Santa Fe Pacific Corporation.”

Layout Overview

- A “Modern” Prototype Freelance Model Railroad
- *Designed & Built for Operations*
 - Designed for “People First”
- Construction Start = 2008
- Modern/Custom CTC Controlled
- Branch Lines, Interchange and Traffic Rights
- Multi-Level (Mushroom) Design Goals:
 - Maximize mainline length
 - Increase distance between locations
 - Provide for long mainline runs & switching
 - Create a feeling of “isolation” for operators



At a Glance...

- **3,000 Sq. Ft. Footprint**
- **1,200+ Freight Cars**
- **120+ Locomotives**
- **21+ Mainline Scale Miles**
- **Daytime LED Lighting**
 - **Daylight color tones**
- **Night Blue LEDs**
- **48” and 58” Track Height**
- **11 DCC Boosters, 50+ Circuit Beaker Protected Power Districts**
- **Increased Wireless Access**
- **160+ Operating Sessions: *Bringing Together Friends, Acquaintances, Fellow Model Railroaders and Worldwide Guests!***

Name	BNSF Fall River Division
Scale	HO (1:87)
Layout Size	3,000 sq. feet, including crew area and dispatch office
Layout Style	Mushroom, linear walk around
Mainline Length	1,300 Feet
Period/era	Modern
Layout Height	Between 48 to 60 inches
Track	Code 83 mainline & yards
Turnouts	No. 8 mainline, No. 6 yard and industries
Mainline Roadbed	Masonite spline, ¾ plywood, and Homosote
Yard Roadbed	¾ plywood & Homosote
Min. Radius	Easements, 36 inch min., superelevated curves
Max Grade	1.8 percent ruling, visible
Scenery	In Progress
Control	DCC - Digitrax Radio
Signaling	Tomar and BLMA signals, CATS CTC dispatching program, Digitrax SE8C and BDL168
Car Forwarding	JMRI Operations, used in “real time”

Prototype vs. Freelance?



A Proto-Freelance Layout...

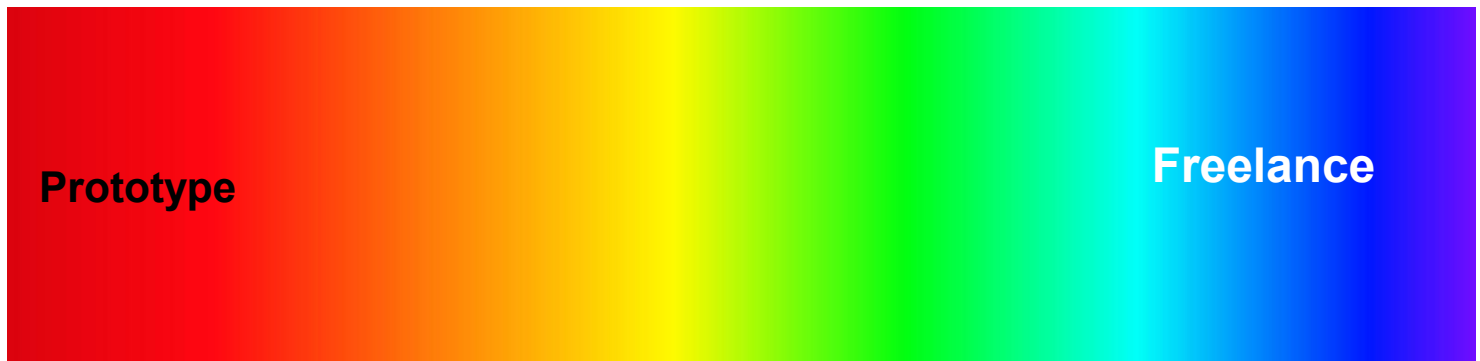
What is a Prototype-Freelance Layout?

According to AI

“... a model railroad that combines aspects of a real-world railroad with imaginative, fictional elements to create a plausible, believable, but ultimately unique scenario.”

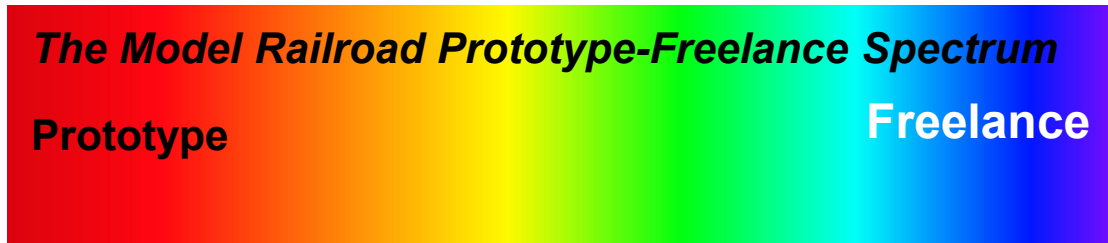
The Prototype-Freelance Spectrum

The Model Railroad Prototype-Freelance Spectrum



Why a Prototype-Freelance Approach?

- **A Personal Choice**
 - ✓ Pressure to model prototype
 - ✓ Nostalgia
- **Provides Freedom, Flexibility and Creativity**
 - ✓ The choice to model industry, scenery and equipment
- **Reduces Potential of Judgement/Criticism**
 - ✓ “There was no industry...”
 - ✓ “That equipment didn’t...”
 - ✓ “That would have never of happened...”
- **Allows Era Change**
 - ✓ Not locked in, ability to moving eras every few years



↑ Prototype vs. Freelance

Locations and Names

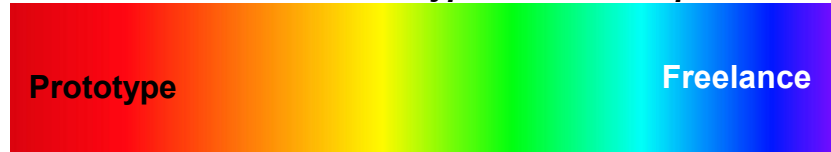
- There is no Representation of any Particular Part of the Country

- ✓ Names carried over from early layout in 1980's

- The Name "Fall River Division"

- ✓ A formative location (county) in South Dakota

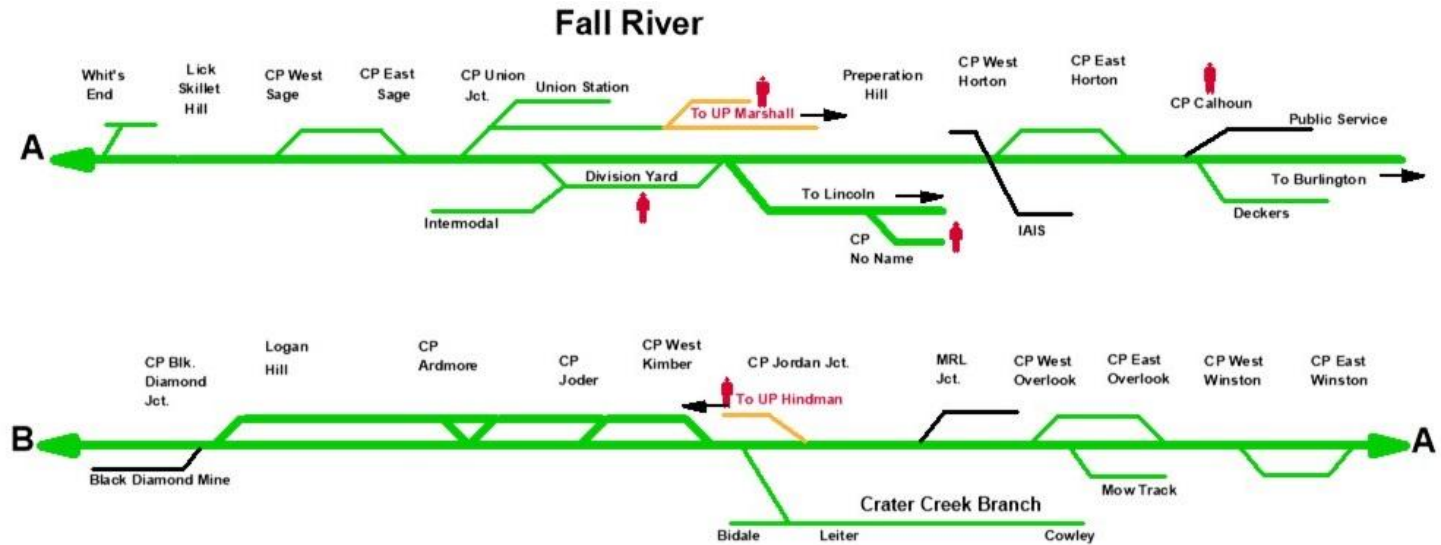
The Model Railroad Prototype-Freelance Spectrum



Prototype vs. Freelance



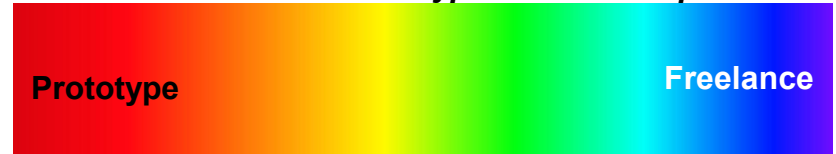
- Youtube Viewer
 "...The funny part? There is a city called Richland in Washington that the BNSF passes through, and that line feeds right into the Fallbridge Subdivision, so that's pretty funny."



Industry Choices

- Prefer Large Industries with Many Spots
 - ✓ Prototype used as inspiration, no exact representation
 - ✓ Names are real, were real, or contrived
- Ability to Place Industries in Various Geographies
 - ✓ East vs. West
 - ✓ Example – Cemex in Ardmore/Joder territory

The Model Railroad Prototype-Freelance Spectrum



↑ Prototype vs. Freelance

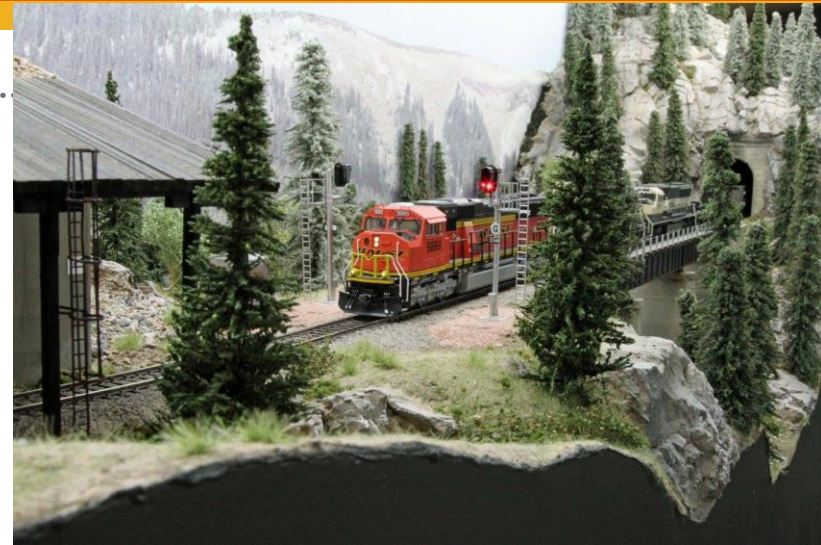
A Quick Story...



BNSF
RAILWAY

Variety of Scenery Choices

- Did Not Want to be Confined Across Layout
 - ✓ Midwest, open prairie, rocky mountains
- Provides for Variety of Structures, Buildings and Industry



The Model Railroad Prototype-Freelance Spectrum

Prototype

Freelance



Prototype vs. Freelance



Equipment Selections

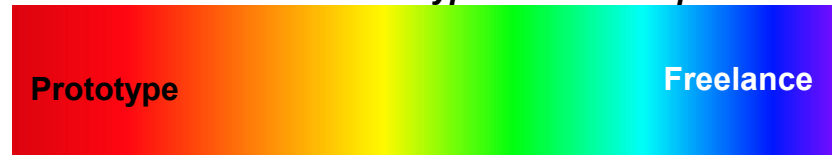
- Representative of BNSF in 2018
 - ✓ 95 percent accuracy
- Some Variety and Freelance
- Often Run During Operations Sessions



“BNSF 3714 spotted at the Fall River engine facility tonight. The Roundhouse Foreman said something about a Tier 4 “credit unit,” however, it may get painted soon. Local rail fans were heard calling it a “Tier 4 Smurf.”



The Model Railroad Prototype-Freelance Spectrum



↑ Prototype vs. Freelance

Equipment Selections



What was the nickname of this particular BNSF paint scheme?

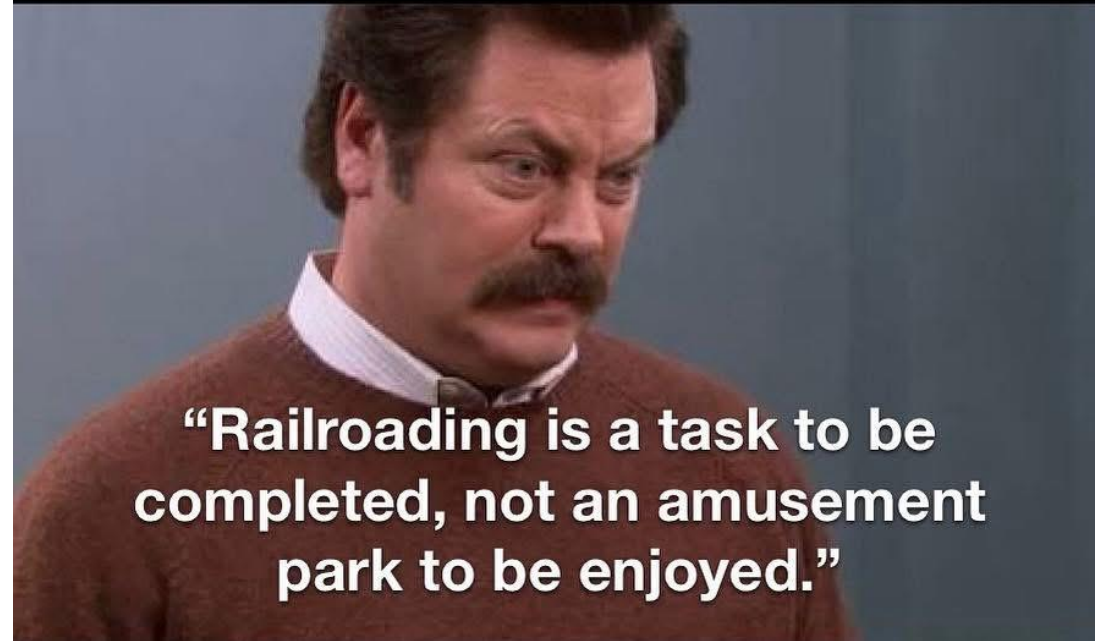


The BNSF 9647, nicknamed the "Vomit Bonnet" was a unique EMD SD70MAC locomotive painted in 1995 to mark the Burlington Northern and Santa Fe merger.

Why a Prototype-Freelance Approach?

- **Prototype - Freelance is a Good Choice**
 - ✓ For me....
- **Don't Let Others Intimidate You**
 - ✓ Remember rule #1
- **Look to the Prototype for Inspiration**
 - ✓ Provides plausibility and believability

When A Prototype Modeler's child sets up a loop of track on the floor:



“Railroading is a task to be completed, not an amusement park to be enjoyed.”

Layout Design



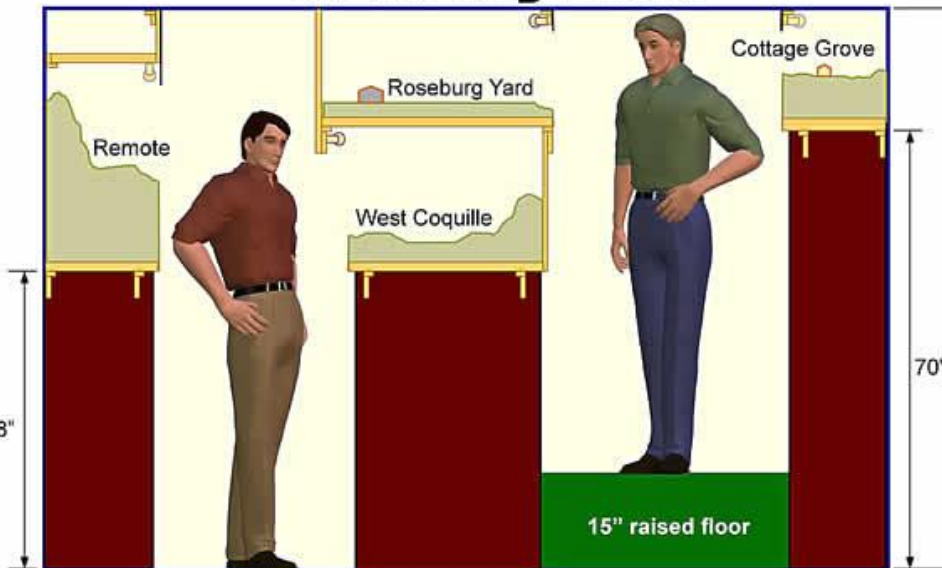
Layout Design - A Multi-Level Layout!

The Mushroom Concept

- Single or Double Level Along Room Perimeter
- Double Level Peninsulas – Face Opposite Direction
 - Stacked on top of each other, raised flooring
 - High ceilings and hidden utilities helpful!



Cutaway View



Layout Design Goals

Plan for People First, Not Track

Layout Design Ideas – From a Casino?

“Influencing the movement of visitors and controlling where visitors look are key elements of casino design ... and we can borrow a couple of ideas” – *Byron Henderson*

Primary Design Objectives

- Direct and focus on the action
- Create an attractive/comfortable space
- Guide operators and visitors – way finding
- Caught in the action - difficult to find an exit!



Layout Design Overview

Approach to the Design Process

- **Started Planning While Home Built**
- **Define Final Footprint**
 - 3rd Planit software
 - Pencil/paper doodle
 - Focus only on aisle and benchwork dimensions
 - Outline with masking tape - validate CAD drawings
- **Did Not Focus on Track Planning**
- **Review, Review, Review....**
 - 1/100 ideas?
- **Confident with Plan – No!**



Mushroom Design

- **Typical L-girder Construction**
- **16-inch Raised Floor**
- **Shadowbox Appearance**
- **48" and 58" Track Heights**
- **17" Deck Separation**
- **Always Truly Directional**



Mushroom Design

Traditional L-girder Benchwork



Mushroom Design

Raised Flooring



Mushroom Design

A Multi-Level Layout, Before and After....



Layout Configuration

Facilitate People Movement - Aisle Width

- **Wider at Yards and Stationery Operating Positions**
 - 36-48 inches
- **Operators Often Congregate in These Areas**
- **24” Radius “People” for Planning Purposes**
- **Define Operator Space**



Layout Configuration

- Facilitate People Movement - Inside/outside Corners
 - Passing Space
 - People “Flow”



Layout Configuration



Layout Configuration



Layout Configuration



Layout Configuration

The “Herniated Helix” Example



Layout Configuration

Create the Feeling of Isolation

- Places the Operator “In the Scene”
- Obstructions – Curved Aisles and Benchwork
 - Perception of longer trains and length in distance
- Backdrops/Walls – Separate Adjoining Aisles/Work Areas
- Use of View Blocks and Pockets/Alcoves - Isolate the Operator

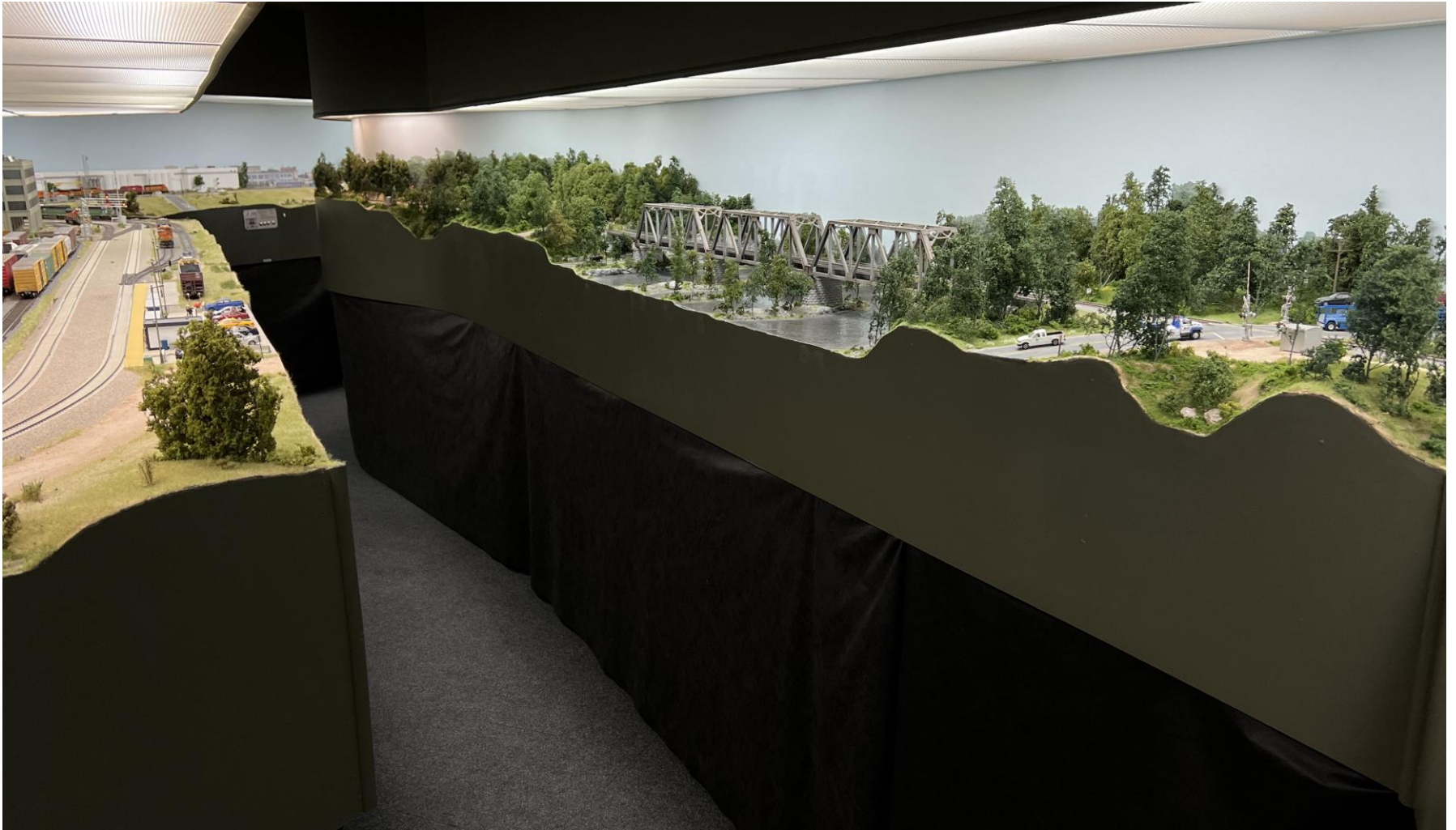


Layout Configuration

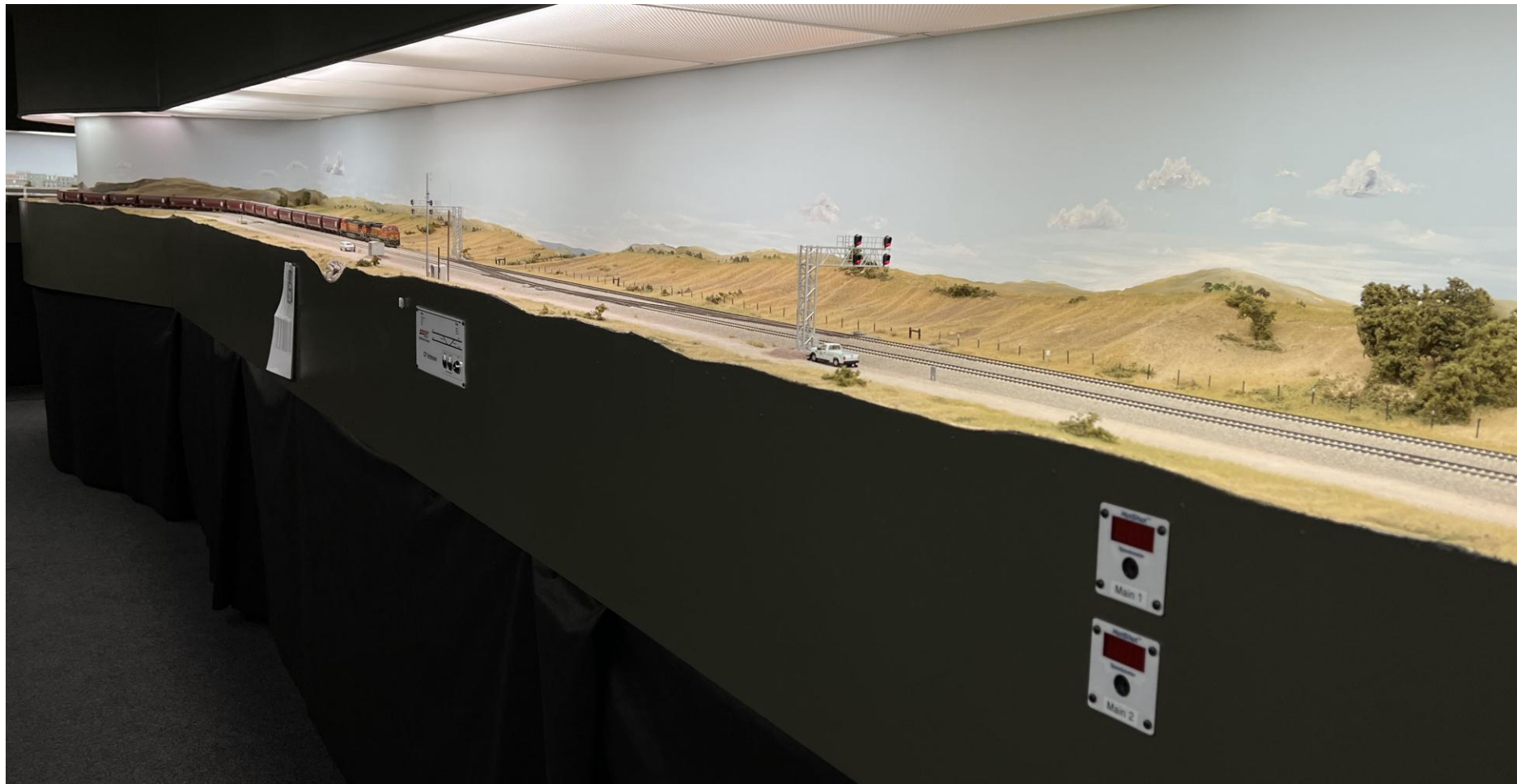
“Negative Space” Between Towns/Scenes

- **Negative Space, Dead Space, Open Space, Green Space?**
- **No Industries, Work Areas, Etc. = Track/Scenery Only**
- **Creates the Feeling of Distance and “Going Somewhere”**
- **Entire Train Not Completely Visible – Creates the Illusion of a Longer Train**
- **Opposite of Operator Work Areas**

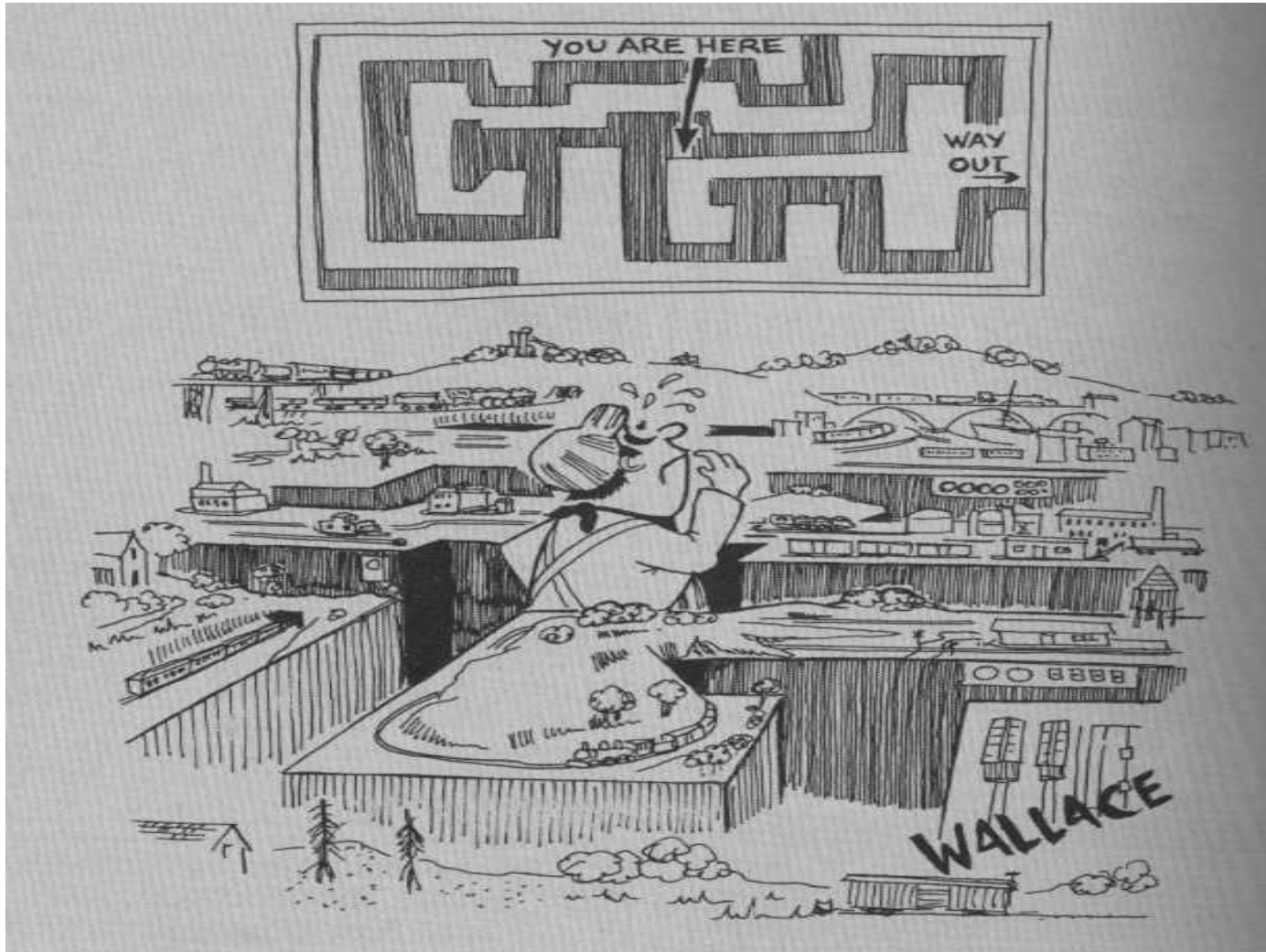
Layout Configuration



Layout Configuration



Wayfinding



Wayfinding is Critical!

Tell them where they are, and where they are going....

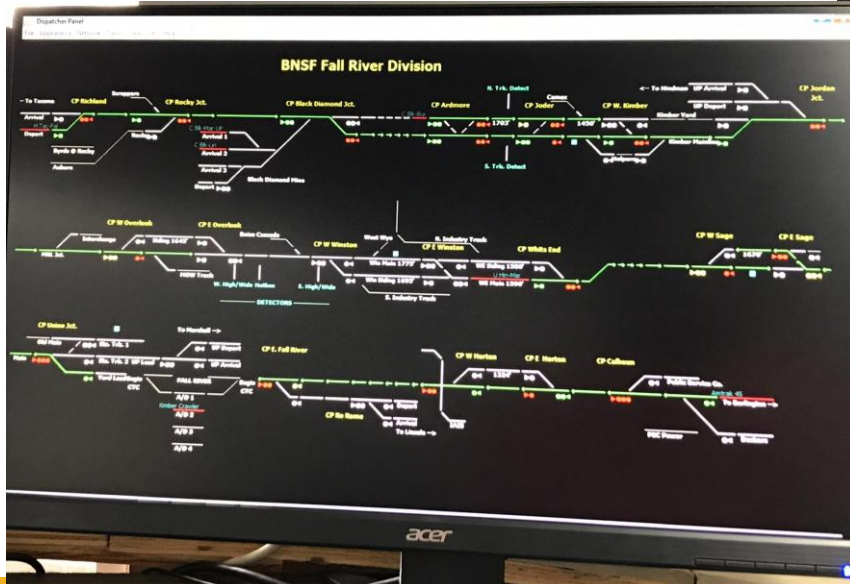


Layout Design



Traffic Center Design

- Active Staging
- Transition to/from Layout
- Hub for Computer Network Design for PCs, printers, etc.
- Crew paperwork, JMRI ops. CATS CTC, etc.



Active Staging -To/From Layout

Setting “The Stage”

Crews never interact with staging - train departure and arrival at crew change points, yards and Industries



Design for Your Guests

Create a Warm, Friendly Operating Environment

- **Provide a comfortable operating area**

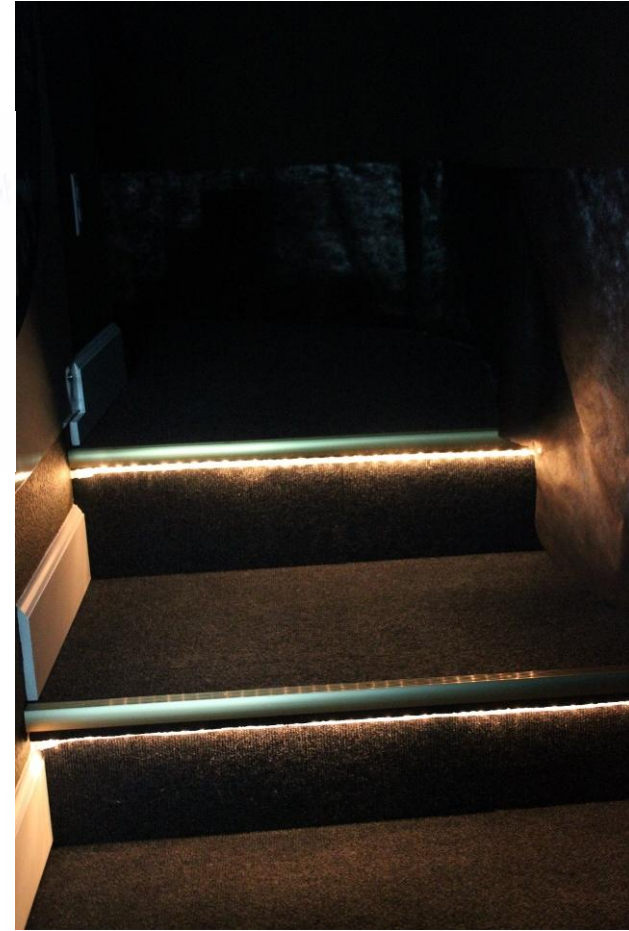
Room Ventilation

- **HVAC and returns**
- **Load balancing for ops. – changes can be difficult to manage**
- **Pre-heating/cooling may be necessary**



Design for Your Guests

Ensure Operator Safety



Design for Your Guests

Create a Warm, Friendly Operating Environment

Provide a place to take a break

Not too Comfy!



Design for Your Guests

Keep it Organized and Clean....

- **Hide the Mess - Eliminate Distractions!**
- **No Clutter, Construction Materials, Etc.**



“If you keep it clean and neat - your operators will respect and take care of your equipment and layout.”

Operations



Operations

Primary Purpose = Have fun, by prototypically simulating the operating practices of the BNSF Railway. We are MODELLING prototype railroad operations, much like modelling a prototype freight car.

- **Accomplished with Approximately 20 People Each Month**
 - **Blend of regular operating crews and guests/visitors**
 - **Flexibility = +/- five operators**
- **Prototype Practices include use of CTC Traffic Control/Authority, Train/Freight Car Handling, Paperwork, Two-way Radios, etc.**
- **Use of Special Instructions, Forms A/B, Bulletins, Etc. are Common**
- **A Variety of Jobs to Accommodate a Variety of Individual Operator Interests**
- **Job Selection is Based on Seniority - Several Positions May be Two-person Jobs**
- **All Trains are Operated Between Crew Change Points – No Interaction with Staging is Required**

The Operating Session – Jobs

- **Dispatcher**
- **Traffic Manager and Assistant**
- **Fall River Yard Jobs**
 - **Yard Master**
 - **East Classification**
 - **West Class/Intermodal**
 - **Hostler/Herder**
- **Crater Creek Branch**
- **Public Service Company Coal Shuttle**
- **Kimber Yard Crew**
- **Kimber Turn (Crawler)**
- **Deckers Turn (Dodger)**
- **Auburn Turn**
- **Extra (6-8)**

Seniority and Crew Call

- **How Seniority is Earned**
 - **Work Sessions**
 - **Event Participation**
 - **Job Selection Each Session = 1 or 2 points**
 - **Distance Variables**
- **Guest job Selection (visitors and new operators)**
 - **Make New Operators Comfortable**
 - **Review Prior to Session Start – Pilot, Solo, Etc.**
 - **Seniority Points Earned if Returned for Another Session**

The Crew Call

- **Seniority Top Down with Some Randomness (80%)**
- **“Bottoms Up” (10%)**
- **Completely Random (10%)**
- **No Job Repeated MORE THAN Two Consecutive Times “cannot choose...”**
 - **Increases skills across all jobs**
 - **Provide opportunities for others to work popular jobs**
- **Sign Up for the Job, and Let’s go Make Some Money for the Railroad!**

Crew Call Application

Reports

CREW CALLER - REPORTS

<u>Crew Calling List</u>	<i>Creates a new random order crew calling list, weighted by seniority.</i>	View
		Print
<u>Points Detail Report</u>	<i>Lists the point totals for each crew member, and a list of all the jobs they have held and how many points were earned.</i>	View
		Print
<u>Points Summary Report (sorted alphabetically)</u>	<i>Lists the point totals for each crew member, sorted by name.</i>	View
		Print
<u>Points Summary Report (sorted by points)</u>	<i>Lists the point totals for each crew member, sorted by number of points.</i>	View
		Print

[Return to Main Menu](#)

Car Forwarding in "Real Time"

JMRI OperationsPro

- Used in "real time" by Traffic Manager
- Networked with CTC for Train/Car Movement Updates
- Modified Manifests and Switch Lists
- Multiple Printers Around Layout

Kimber Crawler

Manifest for train (Kimber Crawler) WB Local Turn at Kimber
 - Crew on Duty at 6:00am
 - Switches industries & interchanges between Fall River Yard and Kimber Yard. Train turns in Kimber and returns to Fall River yard, switching only trailing points in each direction (except Winston Boise Cascade!).
 - Hint: Only take cars necessary between winston and Kimber. Cars may be stored on anywhere except mainline or siding tracks.
 - "Off-Spot" cars may be stored anywhere except main, siding and industry tracks.
 - If Clearwater switch crew is on duty, work together to work interchange tracks.
 - Helpers required if 20 or more cars between Kimber & Winston.
 - Note: If two-person crew, the Conductor is in charge.



Scheduled work at Fall River Yard

[]	Pull	NOKL	728205	Flat Cenbeam	Lumber	from Track 5
[]	Pull	DOWX	21510	Hop Plastics	Pellets	from Track 5
[]	Pull	FBOX	505245	Box High	E (Mty)	from Track 5
[]	Pull	BNSF	545115	Flat, Pipe	E (Mty)	from Track 5
[]	Pull	UTLX	301739	Tank Slurry	Clay Slurry	from Track 5
[]	Pull	UTLX	301536	Tank Slurry	Clay Slurry	from Track 5
[]	Pull	UTLX	14850	Tank Hydrocl	Hydlorc Acid	from Track 5
[]	Pull	UNVX	70737	Tank Caustic	Caustic Soda	from Track 5
[]	Pull	NCHX	46090	Hop Feed	Soy Meal	from Track 5
[]	Pull	BNSF	562245	Flat Cenbeam	E (Mty)	from Track 5
[]	Pull	CP	218254	Box High	OSB Products	from Track 5
[]	Pull	NAHX	323006	Hop Sugar	Sugar	from Track 5

Train departs Fall River Yard Westbound with 9 loads, 3 empties, 705 feet, 930 tons

Scheduled work at Sage

[]	Spot	NOKL	728205	Flat Cenbeam	Lumber	to Savage Transload
-----	------	------	--------	--------------	--------	---------------------

Train departs Sage Westbound with 8 loads, 3 empties, 641 feet, 828 tons

Scheduled work at Whit's End

[]	Pull	KCIX	574	Hop Plastics	E (Mty)	from Apac Hopper Unload
[]	Pull	PLCX	43870	Hop Plastics	E (Mty)	from Apac Hopper Unload
[]	Pull	TTPX	804132	Flat, Pipe	ABS Pipe	from Pipe Loading
[]	Spot	DOWX	21510	Hop Plastics	Pellets	to Apac Hopper Unload
[]	Spot	FBOX	505245	Box High	E (Mty)	to Dock Doors
[]	Spot	BNSF	545115	Flat, Pipe	E (Mty)	to Pipe Loading

Train departs Whit's End Westbound with 8 loads, 3 empties, 653 feet, 834 tons

Scheduled work at Clearwater Interchange

[]	Pull	GBRX	5666	Hopper Chip	E (Mty)	from Interchange
[]	Pull	GBRX	119596	Hopper Chip	E (Mty)	from Interchange
[]	Pull	UTLX	301585	Tank Slurry	E (Mty)	from Interchange
[]	Pull	TBOX	660114	Box High	Paper Prodct	from Interchange
[]	Pull	CITX	775278	Hop Starch	E (Mty)	from Interchange
[]	Pull	BN	219364	Boxcar	E (Mty)	from Interchange
[]	Spot	UTLX	301739	Tank Slurry	Clay Slurry	to Interchange
[]	Spot	UTLX	301536	Tank Slurry	Clay Slurry	to Interchange
[]	Spot	UTLX	14850	Tank Hydrocl	Hydlorc Acid	to Interchange
[]	Spot	UNVX	70737	Tank Caustic	Caustic Soda	to Interchange

Train departs Clearwater Interchange Westbound with 5 loads, 8 empties, 831 feet, 773 tons

Scheduled work at Winston

[]	Pull	INTX	5041	Hop Agg	Aggregate	from TXI Aggregates
[]	Move	INTX	5067	Hop Agg	E (Mty)	from Winston "Off spot" to TXI Aggregates
[]	Spot	NCHX	46090	Hop Feed	Soy Meal	to Winston "Off spot"

Train departs Winston Westbound with 5 loads, 8 empties, 827 feet, 767 tons

Scheduled work at Winston Boise Cascade

[]	Pull	BNSF	541616	Hop WoodChip	Woodchips	from Chip Loader
[]	Pull	BNSF	541436	Hop WoodChip	Woodchips	from Chip Loader
[]	Pull	TTZX	857095	Flat Cenbeam	Lumber	from Centerbeam Loading
[]	Spot	BNSF	562245	Flat Cenbeam	E (Mty)	to Centerbeam Loading

Train departs Winston Boise Cascade Westbound with 8 loads, 7 empties, 965 feet, 1,068 tons

Scheduled work at MRL Interchange

Fuseses must be used to protect the Ordinance Road crossing (both directions).



Speaking of Car Forwarding...



How Many “Route Miles” Does the BNSF Currently Operate?

“The company operates 32,500 route miles, which makes it one of the largest freight railroad networks in North America.”



How Many Different US States Does the BNSF Currently Operate?

“This extensive system stretches across 28 U.S. states and three Canadian provinces.”

Seasonal Influences

**Winter
Weather**

***A Two
Person
Job....***



Seasonal Influences

High
Fire
Danger



Maintenance In The Way



Maintenance In The Way

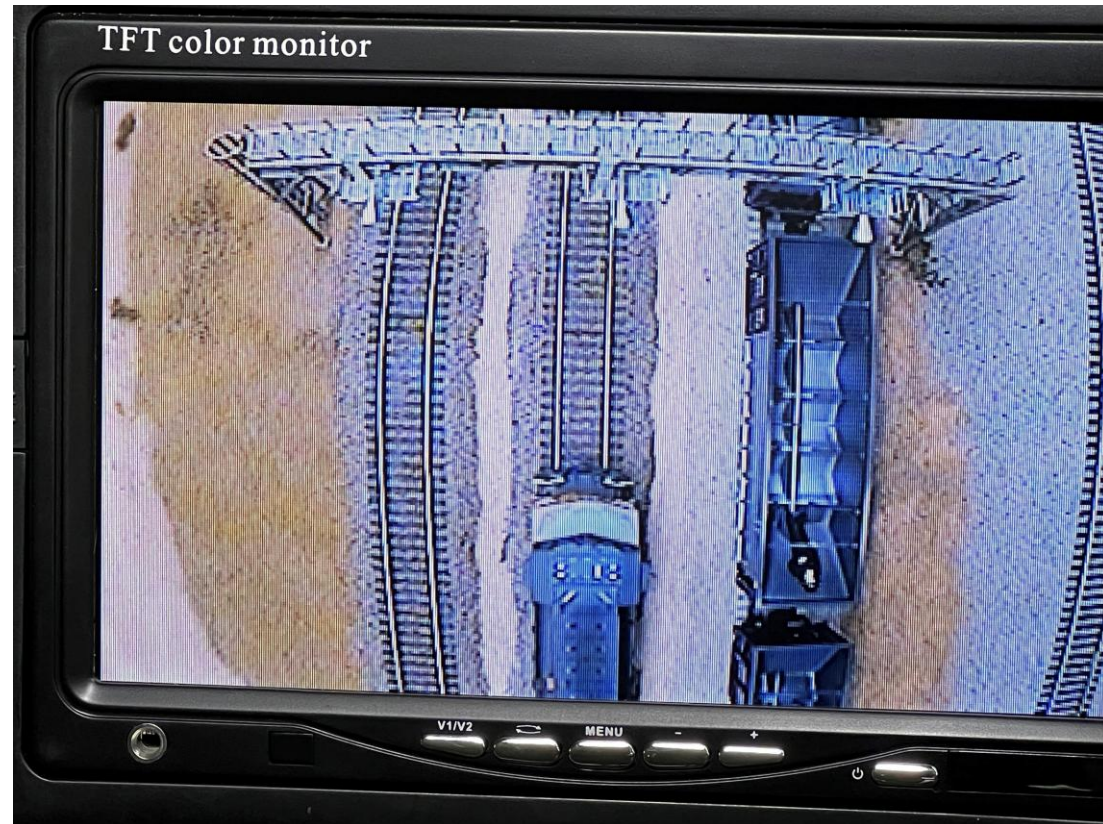


Maintenance In The Way



Technology

- **Coal Loading Surveillance Cameras**
 - Monitor cars for trespassers prior to loading
 - Use of O scale figures



Technology

- **Defect Detectors**
 - **Random Hot Box or Shifted Load**
 - **Axle Count**
 - **Temperature**
 - **Bad Order Set Out**
 - **Coal Protection Cars – Fulfill Coal Delivery Contracts**
 - **Dispatcher Panel Alert**



Technology

- **Track Scale**
 - Logging of Loads Leaving Industry
 - Simulated Weight Loaded Cars and Scale Test
- **Speedometers**
 - All Track Speeds Defined in Timetable
 - High-Speed Mainline
 - Local Alerts



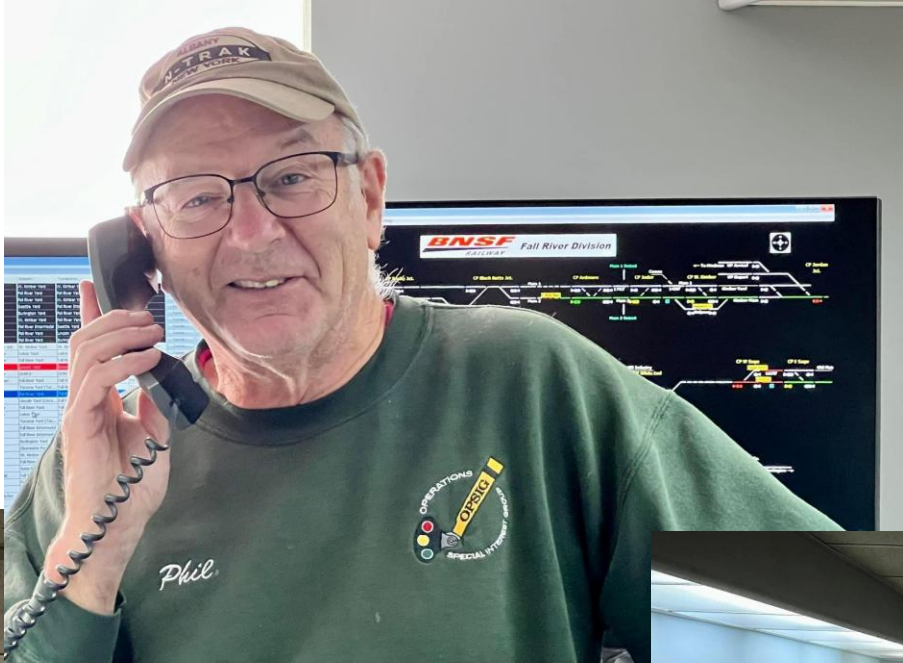
It's About Having Fun!



It's About Having Fun!



It's About Having Fun!



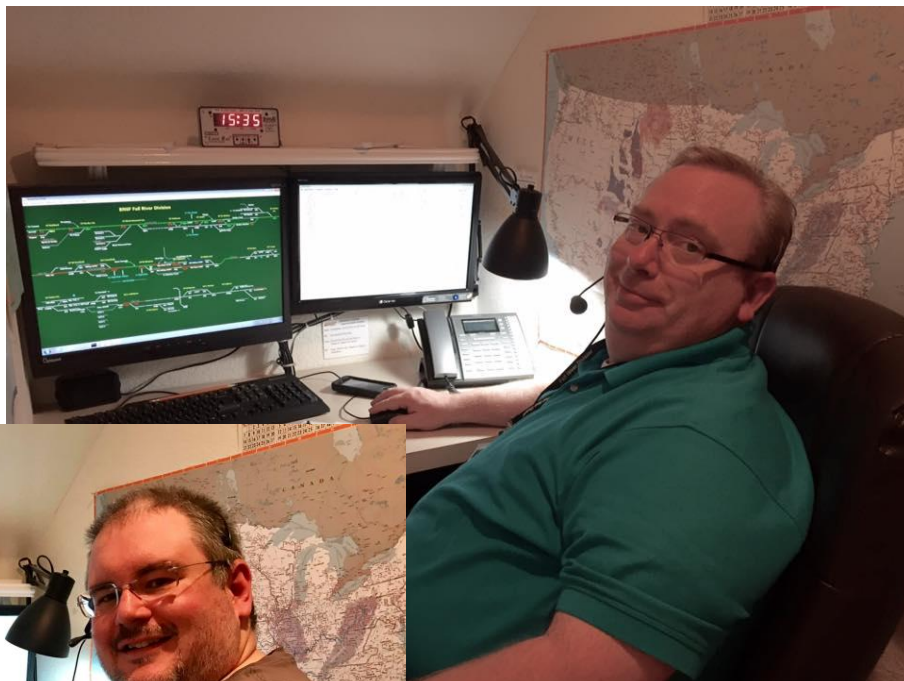
It's About Having Fun!



It's About Having Fun!



It's About Having Fun!





Fall River Division

www.bnsfrr.net

<https://www.facebook.com/Fallriverdiv/>