

GREAT NORTHWESTERN RAILWAY

OPERATIONS ORIENTATION



History of the GNW

- **Connects UP/SP Overland Route and the AT&SF Santa Fe Trail - As the C&S Collapsed, GNW purchased the old DSP&P R.O.W. to provide a connection into Denver**
- **Set between 1970 and 1980**
- **Strong ties and commonality with the Southern Pacific**
- **First and Second Generation Diesels - GNW necessarily utilizes second hand units**

Green River
*Connection to the
Rio Grande and
Western Pacific RRs*

Denver
*Connection to the Burlington
Northern and Union Pacific
RRs*

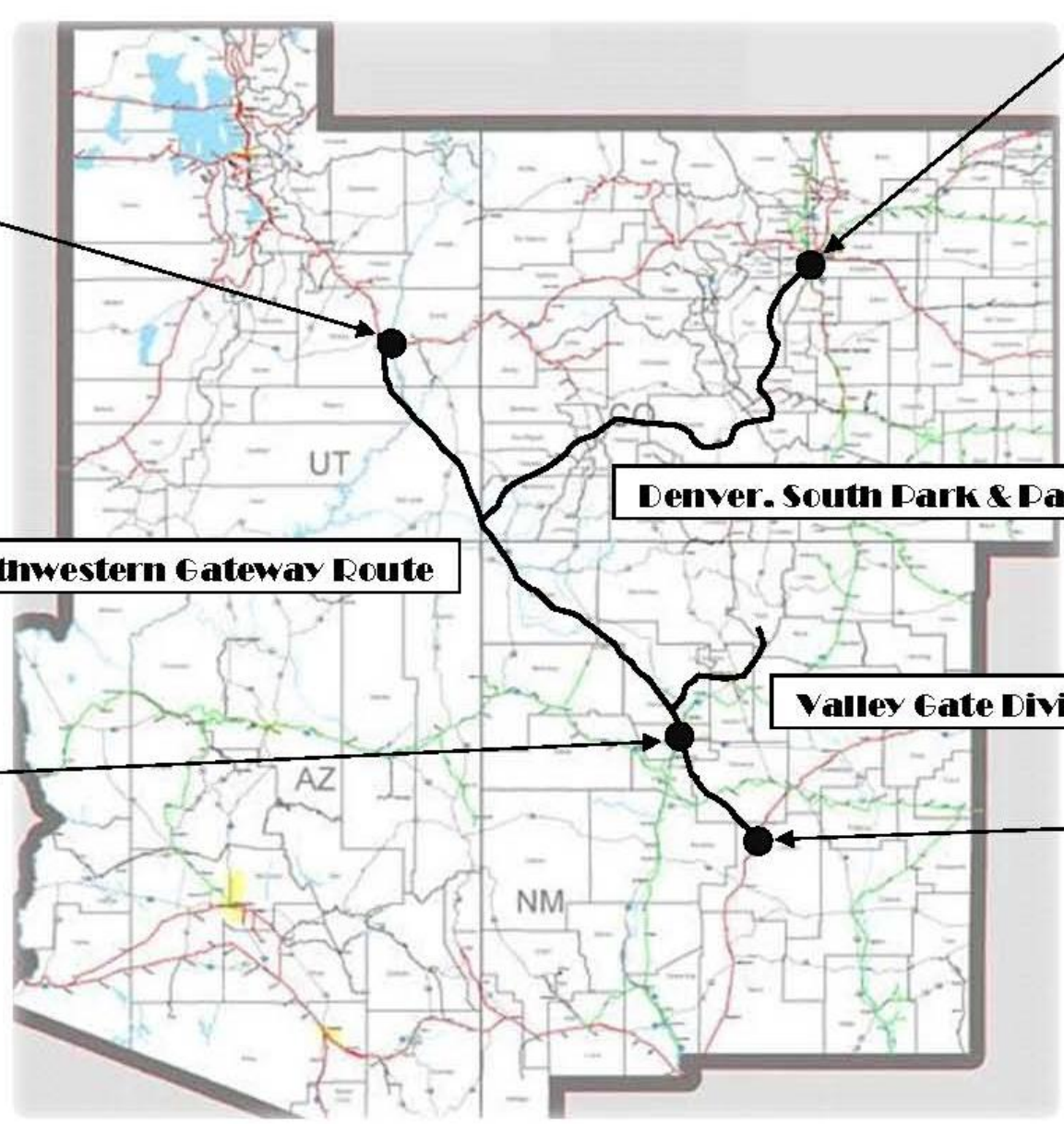
Northwestern Gateway Route

Denver, South Park & Pacific Route

Valley Gate Division

Bernalillo
*Connection to
the Santa Fe
Rwy*

Tucumcari
*Connection to the
Southern Pacific and
Rock Island RRs*



WARM SPRINGS DISTRICT/ NEW MEXICO DIVISION

Segment of bridge line between Utah
and New Mexico

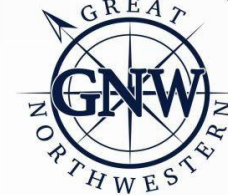
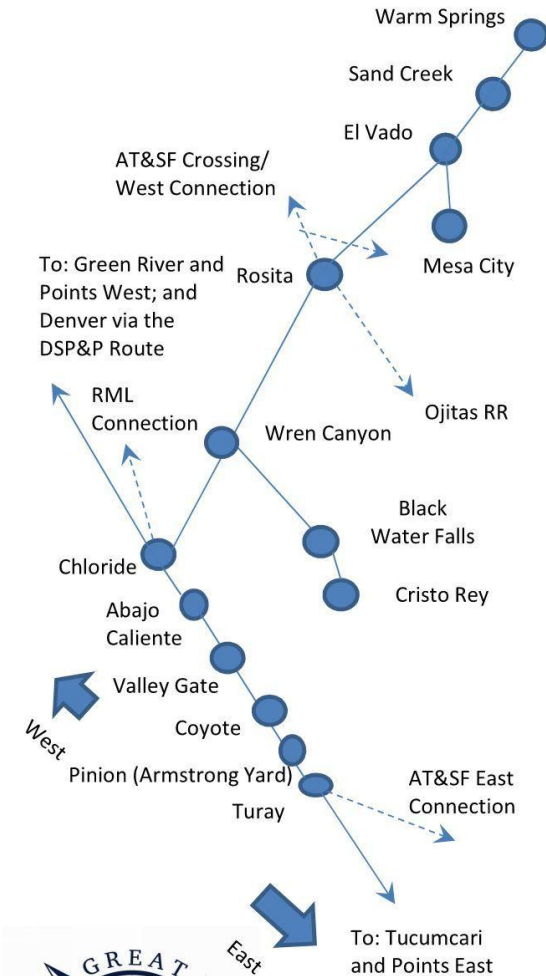
Branch line to Warm Springs

Three Yards – Armstrong, Valley Gate
and Warm Springs

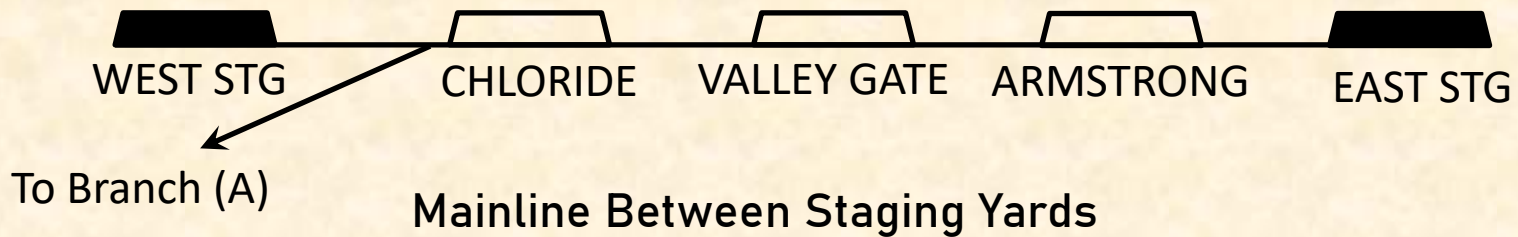
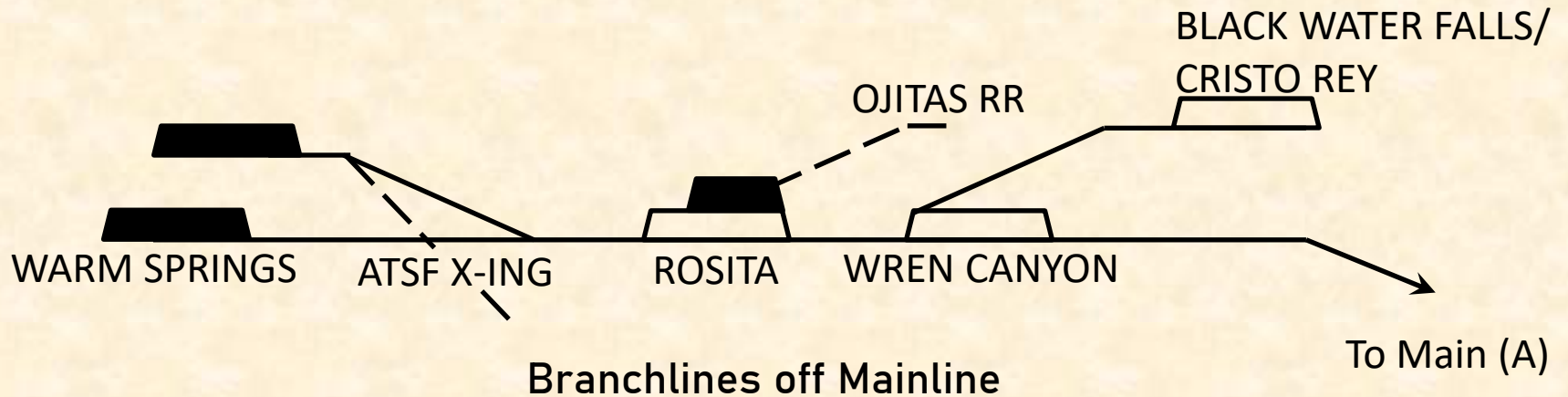
Staging yards represent points east and
west

WARM SPRINGS DISTRICT

AREA MAP



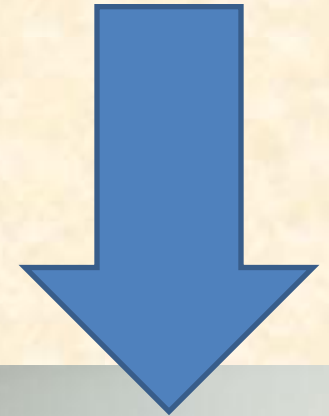
The LAYOUT of the Layout



STAGING...

...Resides Under Armstrong...

- *9 Tracks*
- *3 Trains per Track (East, Mid, West)*



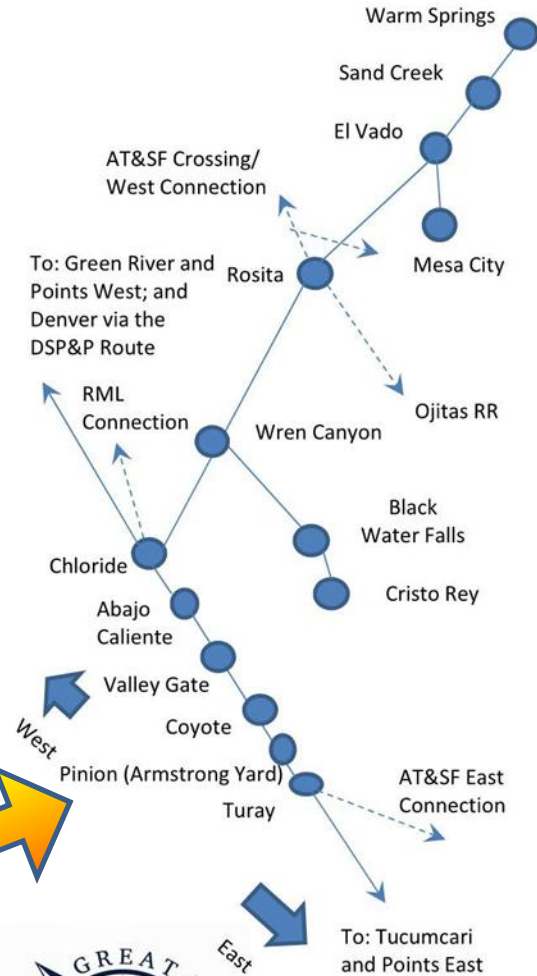
ARMSTRONG

- Armstrong is primary train assembly and departing yard



WARM SPRINGS DISTRICT

AREA MAP

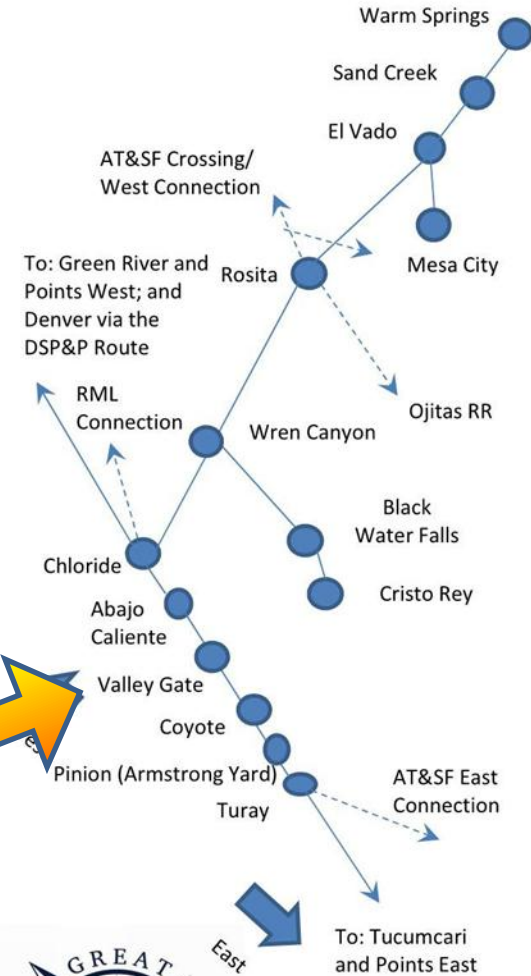


VALLEY GATE

- Valley Gate is home to Colorado & Southern Scenic
- Road Crew Assignment



WARM SPRINGS DISTRICT AREA MAP



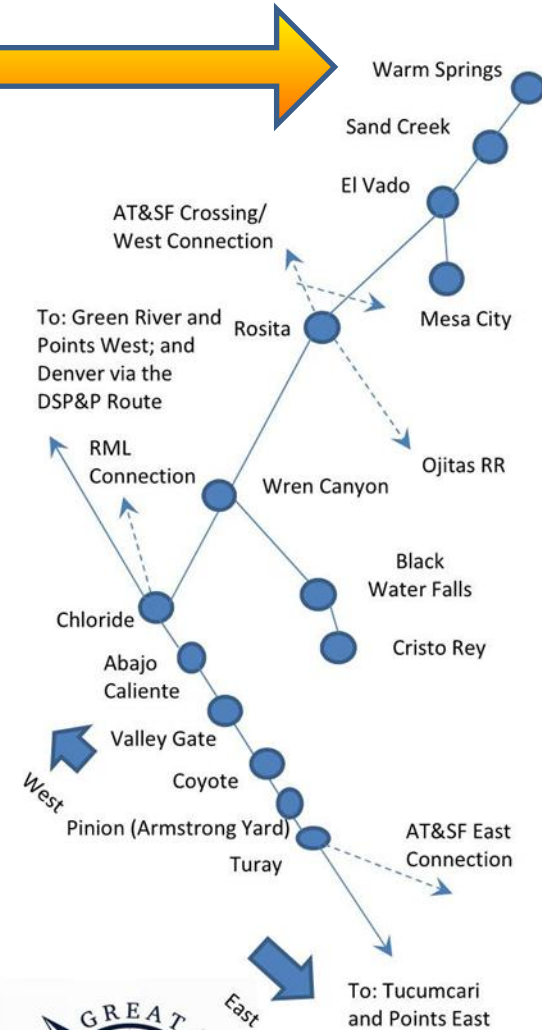
WARM SPRINGS

- End of branch line
- Warm Springs switches (services) cars from surrounding industry.
- “Hauler” freights transfer cars to Valley Gate and from Armstrong.



WARM SPRINGS DISTRICT

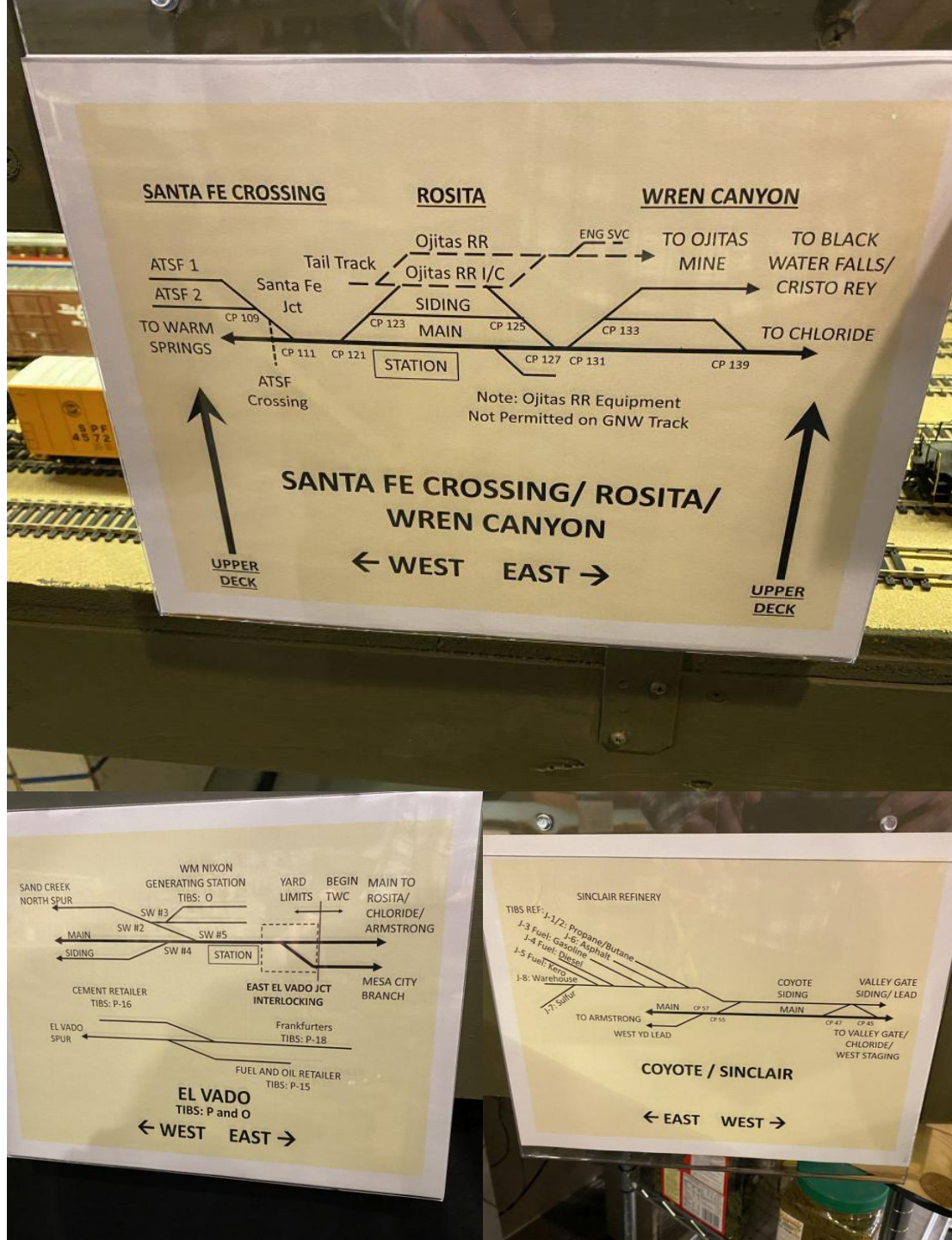
AREA MAP



LAYOUT SIGNAGE

Signs located around layout indicate:

- Location
- Direction
- Track Names
- Industry Names and TIBS Numbers





If Needed...
Step stool available at room entry.

Access to Upper Deck

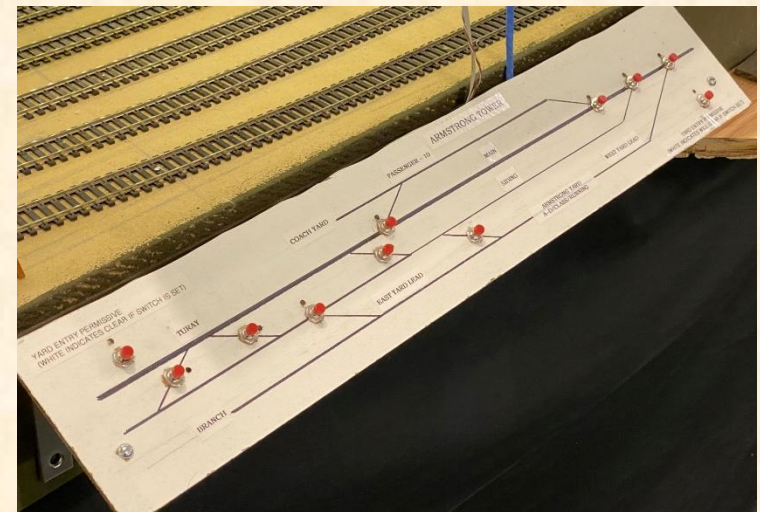


LOCAL CONTROL PANELS

Warm Springs (East El Vado):
Permission to Enter Yard



Armstrong: Permission to Enter
and Local Override of DS
Controlled Turnouts



Upper Deck: Local Override of DS
Controlled T/Os – Note Amber
LED indicate “off normal” position

Turay: Remote Control And Visual
Monitoring Of Wye

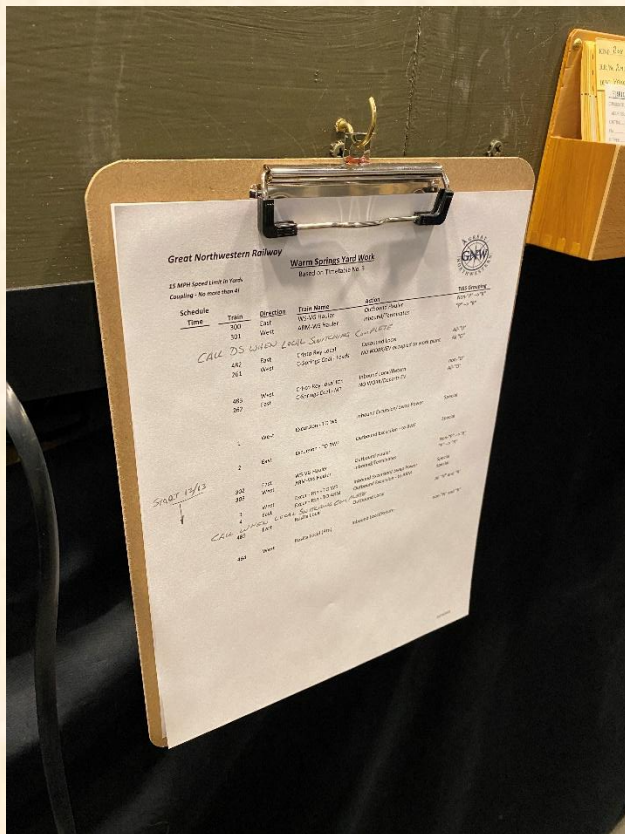


OPERATING POSITIONS

- ***Armstrong Yardmaster*** – Primarily an assembly and outbound yard.
- ***Warm Springs Yardmaster*** – End of branch – classification and local industries.
- ***Road Engineer 1/2/3 (1/4)*** – Handles all train movements outside of yards, including throughs, locals and transfers. Occasionally handle work in Valley Gate.
- ***Dispatcher*** – Responsible for the orderly release and control of trains and road power.

YARD CREWS

- Blocking/ Classifying
- Track Train Sequence



Have

...one or more dedicated switcher locomotives

Have

...some local industries

Stay off

...main track UNLESS obtained permission!

ROAD CREWS

- Move trains across district.
- Through trains from Staging to Staging, dropping cars at Valley Gate and picking up at Armstrong as required.



- Locals out and back from yards to service industries.
- Operates Excursion and Amtrak passenger trains.

ALL movements on main track by Track Warrant!



ROAD CREW: TRAIN ASSIGNMENT

ROUTINE

Get Train Pack – Ask DS for the next train – you will be handed a train pack which includes locomotive assignment. Review and familiarize.

Locate Train – Find power. Typically ROAD crew brings power from service tracks to train.

Check Consist – Before leaving, check car cards against train.

Obtain Track Warrant – Contact DS either by visiting office or via phone.

Run Train – Follow instructions. **READ THEM!**

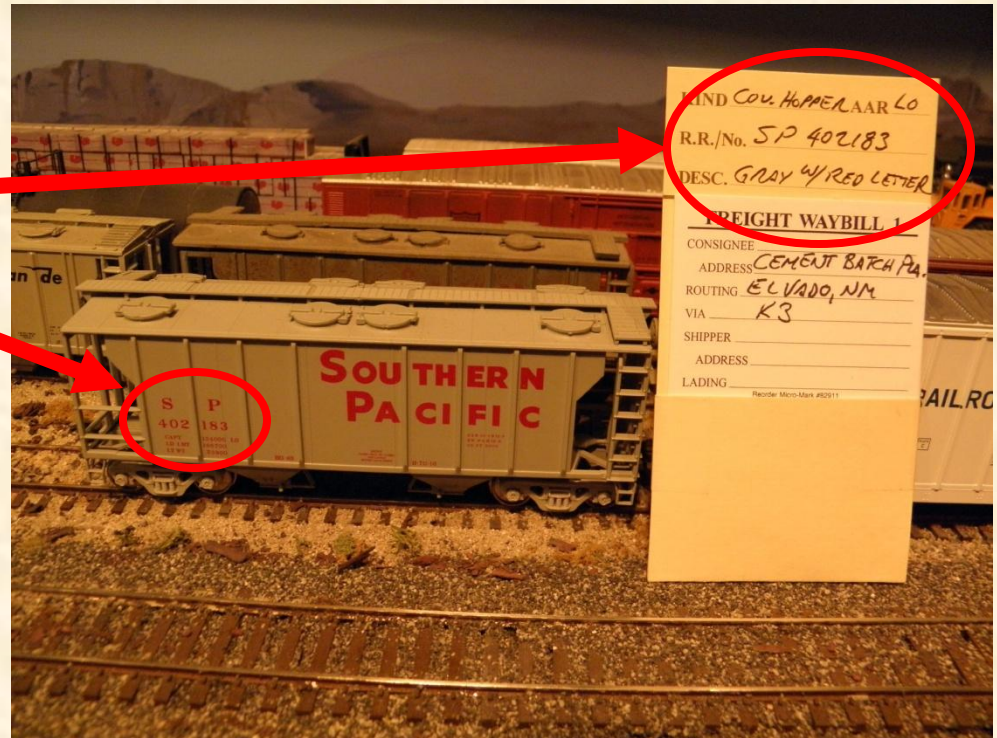
Hostle Power to Engine Tracks (or tie up on staging) – Shut off power when completed (E-Stop).

Return to Dispatcher – Train pack AND locomotive card.

Car Cars and Waybills

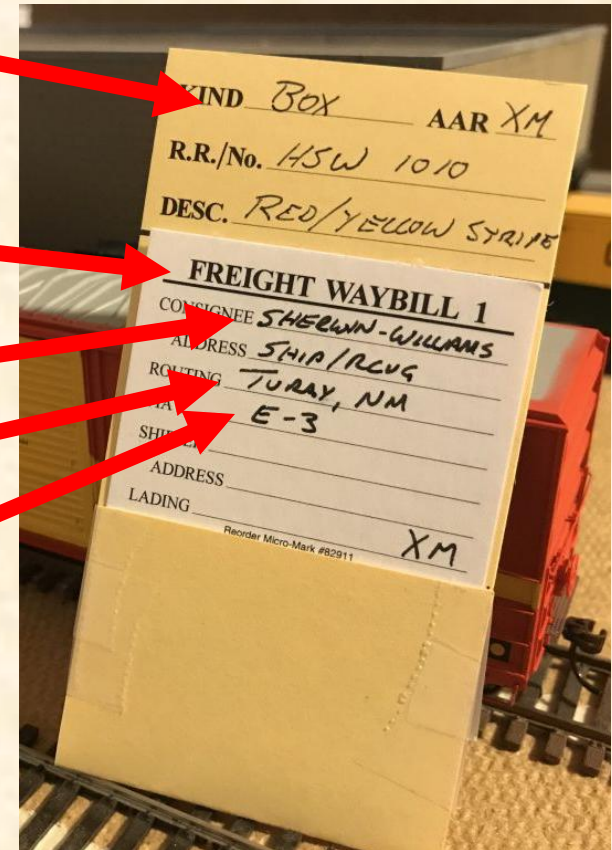
All Freight Traffic Moves via CC/WB

Reporting Marks
and Description
Match Car to Card



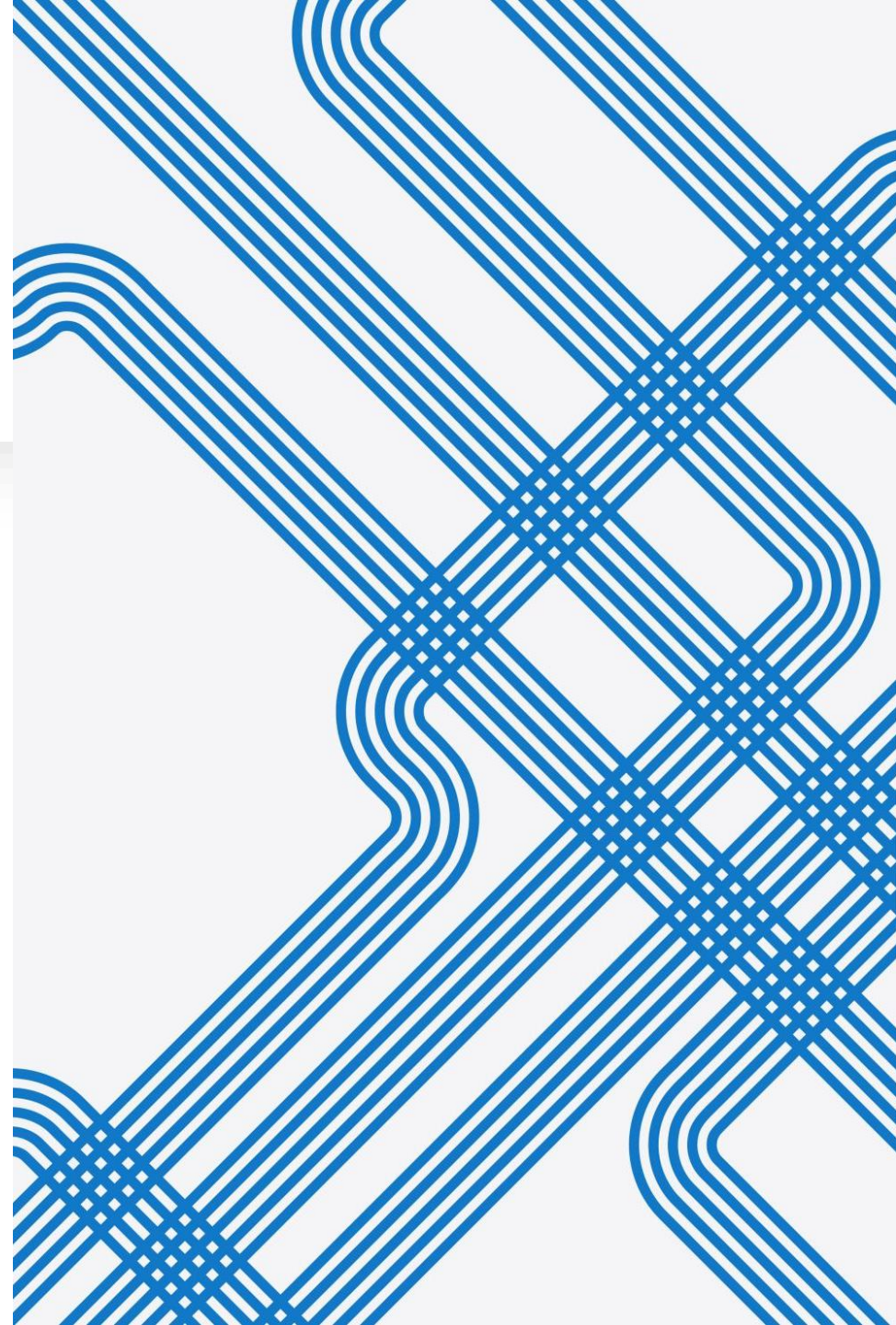
How To Read A Car Card/Waybill

- Each Car Card... has an associated Waybill.
- The Waybill identifies the car's destination... the destination city... and the "TIBS" location.



Train/Industry Blocking System (TIBS)

- To simplify car routing and locating industries, the GNW uses the Train/Industry Blocking System.
- Every city or off layout destination receives a LETTER CODE.
- Within each city, each possible car destination receives a specific NUMBER code.



TIBS Listing

S Turay is TIBS Letter ID "E"

NKK Design Works is TIBS No ID "E-1."

Therefore, all cars destined for NKK Design Works will have TIBS ID E-1.

<u>PINION DISTRICT - ALL CARS WITH TIBS "E" THRU "J"</u>	
<u>E</u>	South Turay
E-1	NKK DesignWorks
E-2	Wainwright Plastics
<u>E</u>	E Turay
F-1	Sherwin-Williams - Shipping/Receiving
<u>G</u>	Halcon Cement
G-1	Bulk Cement
G-3	Bagged Cement
<u>H</u>	Armstrong
H-1	GNW Engine Service - Sand
<u>I</u>	(Spare)
I	Covate/Sinclair Refinery

Off-Layout Destinations

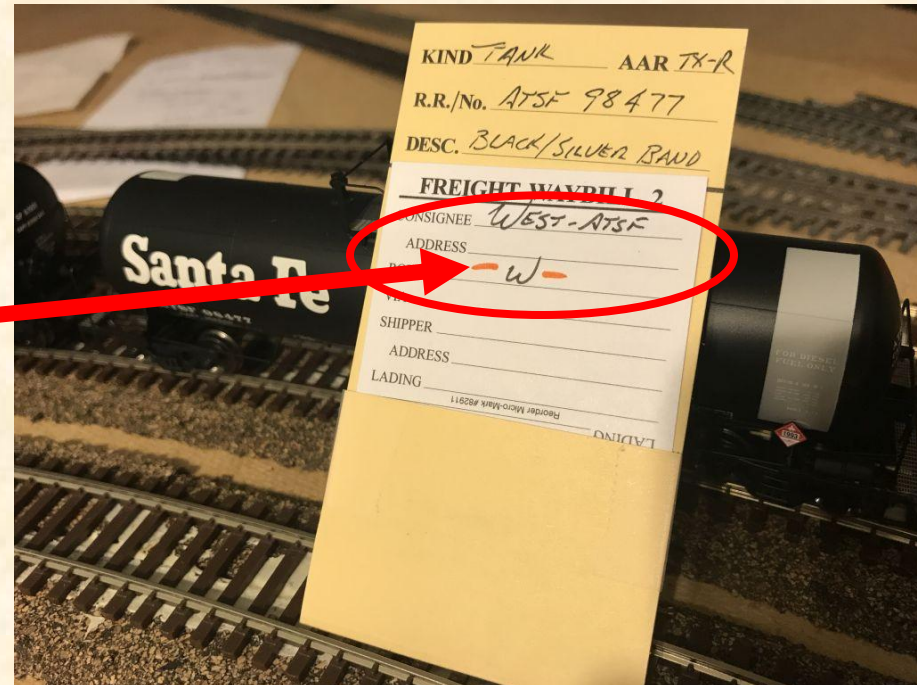
Generally off-layout destinations are only the TIBS Letter ID

Off-Layout (Staging) Destinations

Westbound

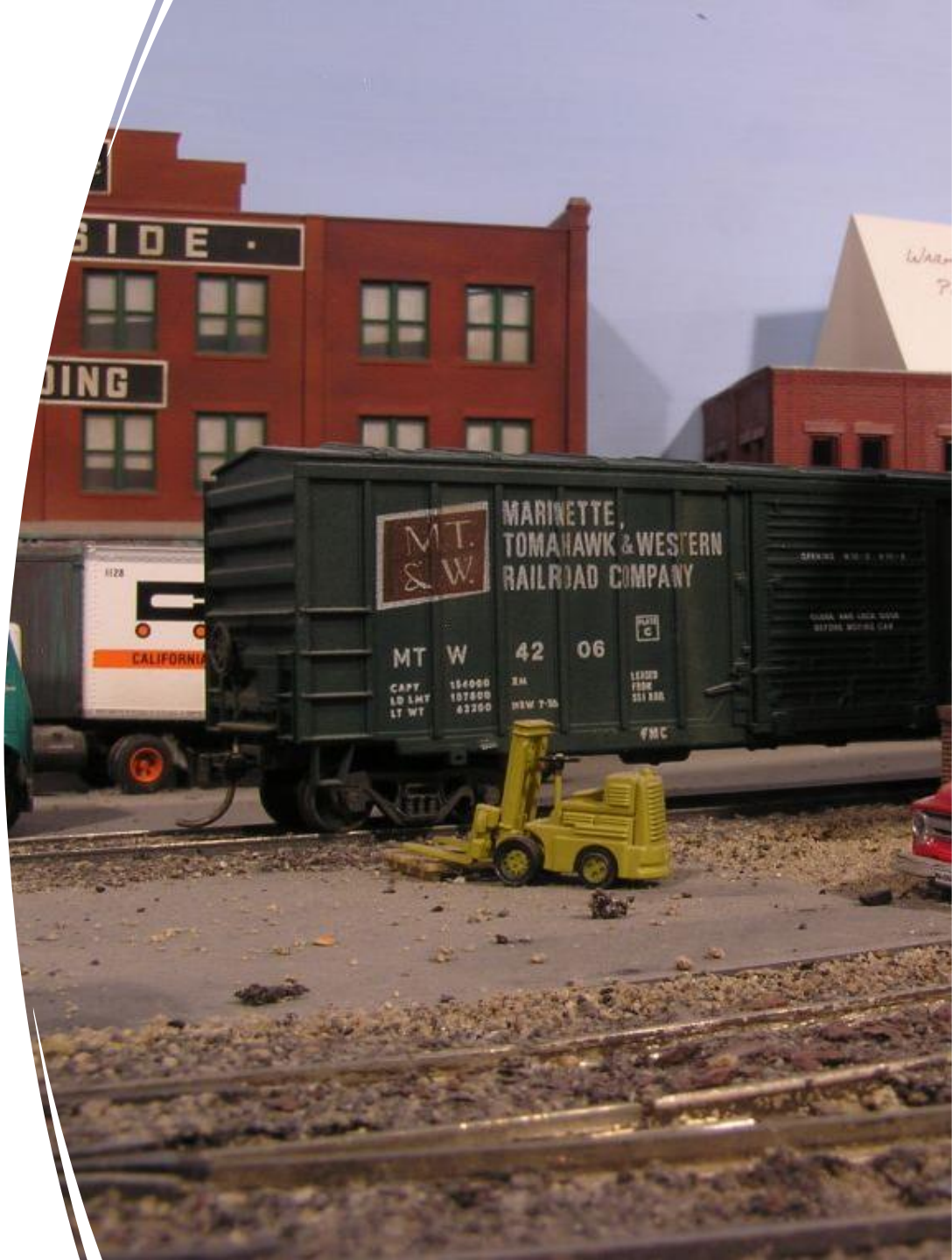
<u>W</u>	ATSF Staging	ATSF via Rosita (Orange)
<u>X</u>	West Staging	(Reserved)

Waybill is color coded to make it easy to see the destination is off layout.



Using TIBS

- Group cars with same TIBS designations; letters then numbers. (Called “BLOCKING”)
- Don’t need to know every industry destination; locals will get it there.
- IF time is available, YM can block cars.



Spotting Cars/Handling Cards

- *Once car is spotted, place car-card in Set-Out pocket*
- *Car-Cards for cars to be picked-up are in Pick-Up pocket*



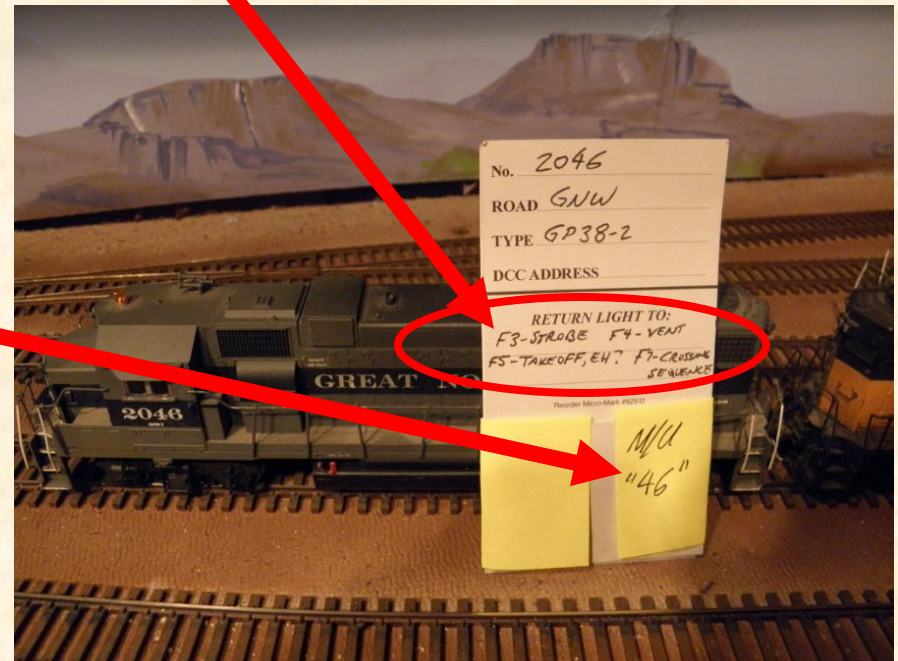
Spotting Cars/Handling Cards

- *IF car cannot be spotted, place car on clear and available track and car-card in "HOLD" pocket.*
- *HOLD indicates car to be spotted when space available.*



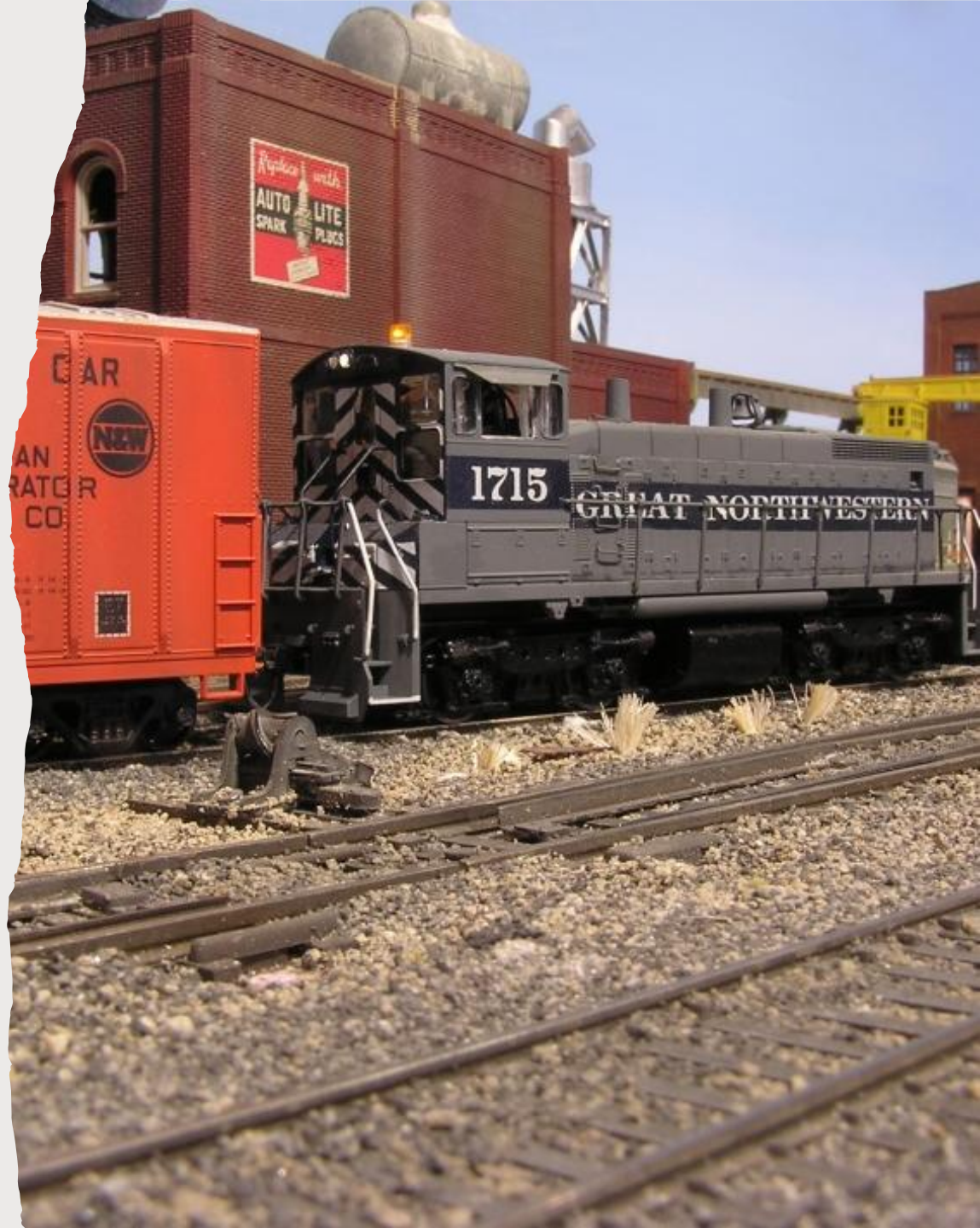
Non-Revenue Rolling Stock

- Engine, Caboose and other equipment
- Follow same Car-Card format
- Includes loco operation info
- “MU” locos –
CC’s bound together
with sticky indicating
consist address.
(Use as LOCO number)



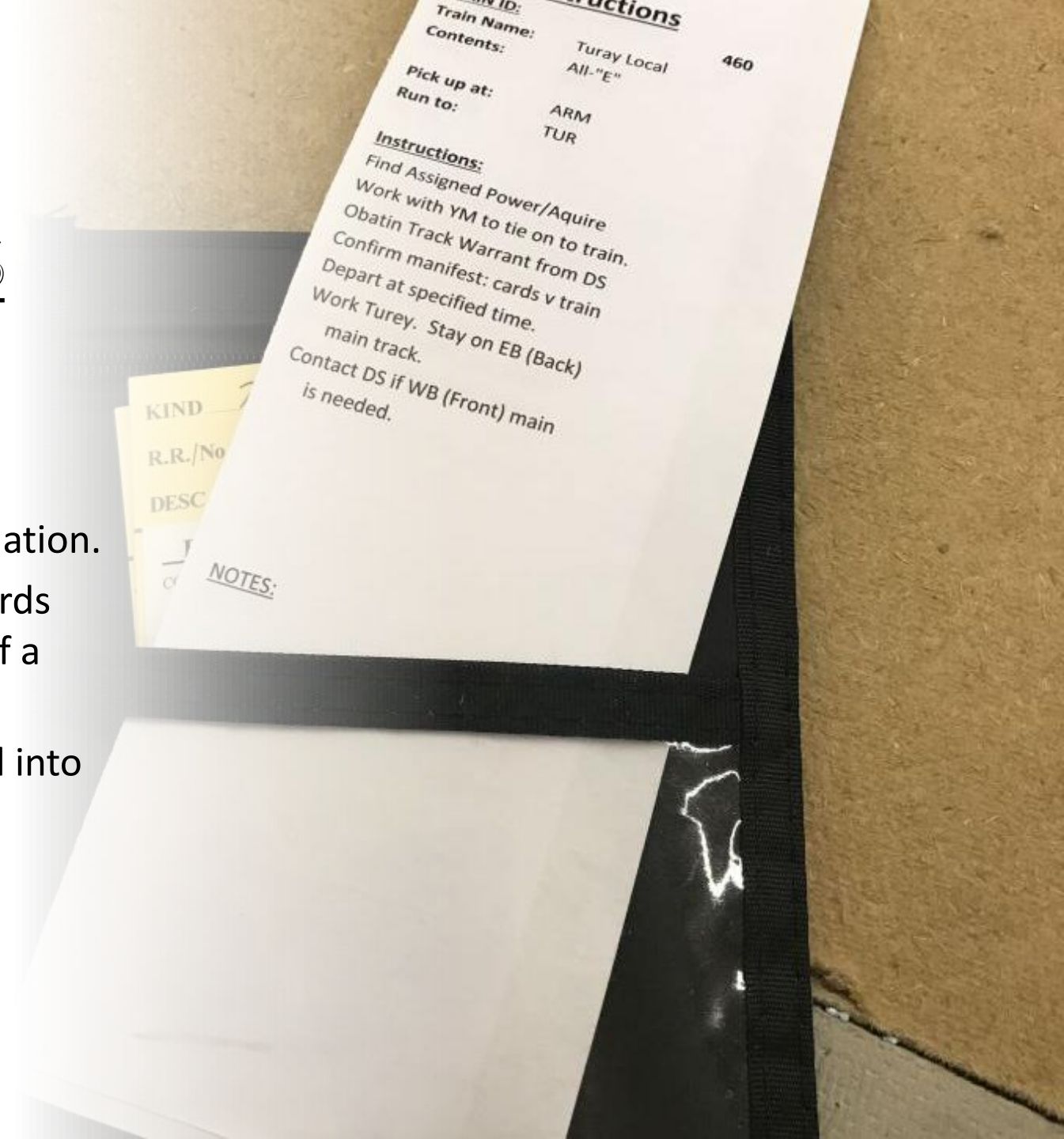
MAKING UP TRAINS

- Cars for a particular destination are collected to form trains.
- Trains are made up and released on a sequence, the Train List.
- Scheduled trains are run in sequence – no fast clock.



TRAIN PACKS

- Car-Cards are collected for a particular destination.
- The collected cards form the basis of a train.
- Cards are placed into a pouch called a "TRAIN PACK."



More on...

TRAIN PACKS



- Pouch contains Train Card
- Train Card identifies info for operating that particular train.
- Train Packs are used **ONLY ONCE** during an operating session.
 - Every train has a unique number and schedule.
 - There are unique extra packs for extra trains.



Train Card

Identifies all relevant info for operating a train:

Train Name
And TIBS contents

Train From/To
and
General
Description of Work

Use the NOTES section for a scratch pad, or ID issues surfaced during your run. (They WILL be read!)

Train Number

Train Instructions

TRAIN ID: 300

Train Name: WS-ARM Hauler

Contents: Non-"P" -->"R"

Pick up at: WS

Run to: ARM

Instructions:

- Find Assigned Power/Aquire
- Work with YM to ID power/train.
- Obtain Track Warrant from DS
- Couple onto train; airtest.
- Confirm manifest: cards v train
- Depart at specified time.
- Run to destination.
- If possible, call in cleared.
- Terminate train with DS
- Work with YM to park power

NOTES:

Dispatching ...and Control of Trains



THE GNW OPERATING CONCEPT

- Trains from staging bring cars onto the layout:
 - SP and ATSF through trains; CRIP and RML transfers
- Balance of car movements are made by trains that originate and terminate on the layout.
 - Locals
 - Haulers
 - Yard Transfers
- Amtrak
- Excursion
- Commutes (history!)



Great Northwestern Railway

ARMSTRONG LINEUP - SORTED BY TIME



15 MPH Speed Limit in Yards

Coupling - No more than 4!

Based on Timetable No. 11

Work with Armstrong YM for Transfers

Obtain clearnace from DS for Transfers

Schedule	Train	Direction	Train Name	Action	TIBS Grouping
1st Trick					
8:00 AM	300	East	Armstrong Hauler	Inbound Hauler	Not: "P" thru "V"
8:10 AM	301	West	Warm Springs Hauler	Outbound Hauler	"P" thru "V"
8:45 AM	200	East	EB GNW Through	Rcv shorts; Send ALL EB (TIBS A, B, C)	"A", "B", "C"
8:45 AM	201	West	WB GNW Through	Rcv shorts; Send ALL WB (TIBS W, X, Z)	"W", "Y", "Z"
9:30 AM	800	East	Excur Relocate	Drop cars on Passenger Tk	Special
10:00 AM	1	West	Excur - TO WS	Outbound Excur - Dep Pass Tk	Special
10:40 AM	451	West	Sinclair Lcl AM (Out)	Outbound Local	All-"J"
11:45 AM	4	East	Excur - Rtn TO ARM	Inbound Excur - Pass Tk	Special
12:28 PM	452	East	Sinclair Lcl AM (Rtn)	Inbound Local	Non-"J"
12:29 PM	801	West	Excur Relocate	Outbound Relocate	Special
12:45 PM	34	East	AMTK - EB San Juan	Amtrak - NO WORK	Pass
1:10 PM	926	East	ATSF Desert Flyer	Rcv shorts; Send ALL EB (TIBS A, B, C)	"A", "B", "C"
1:15 PM	925	West	ASTF Canyon Cruiser	Rcv shorts; Send ALL WB (TIBS W, X, Z)	"W", "Y", "Z"

Release of Trains through **TRACK WARRANT AUTHORIZATION**

- Two kinds of track:
 MAIN LINE and Everything Else...
- Yard Areas Under Yard Master Control
- Mainline Under Dispatcher Control
- Need Authorization to Enter and Use Mainline



TRACK WARRANTS

- Generally written; may be Verbal for short movements
- Defines Limits of Authorization
- Authorizations should be read back to assure understanding
- Once given, train OWNS that track

GREAT NORTHWESTERN RAILWAY TRACK WARRANT

No. _____, 19 ____

To: _____ At: _____
(Mark "X" in box for each item instructed)

1. Track Warrant No. _____ is void.
2. Proceed from _____ To _____
On _____ Track
3. Proceed from _____ To _____
On _____ Track
4. Work between _____ & _____.
5. Not in Effect Until Arrival Of _____ At _____.
6. Joint Authority Between _____ And _____.
Note: Trains must move at RESTRICTED speed.
7. This Authority Expires at _____.
8. Hold Main Track At Last Named Point.
9. Clear Main At Last Named Point.
10. Do Not Foul Limits Ahead of _____, _____.
11. Between _____ & _____
Make all movements at restricted speed.
Limits occupied by train, engine, men or equipment.
12. Do Not Exceed _____ MPH Between _____
& _____
13. Track Bulletins In Effect _____, _____,
_____, _____, _____, _____
14. Other Special Instructions: _____

OK _____, _M Disp. _____ Copied By _____

With the understanding that all mainline track switches within the limits released are lined for the main track:

Reported Clear _____ at _____, _M By _____
(Location) (Time) (Crew Member)

Reported Clear _____ at _____, _M By _____
(Location) (Time) (Crew Member)

Reported Clear _____ at _____, _M By _____
(Location) (Time) (Crew Member)

TRACK WARRANTS

PART 1: Header

- Sequence number

GREAT NORTHWESTERN RAILWAY
TRACK WARRANT

- Date

No. _____, 19____

- Train No.

To: _____ At: _____

(Mark "X" in box for each item instructed)

- Where you are

TRACK WARRANTS

PART 2: Authorizations

- Provides SPECIFIC authorizations for train to use Main Track
 - Not all blocks will be checked
- Train HOLDS the authority listed as defined in the Warrant

Segment 1:

1. Proceed from _____ To _____
2. Not in Effect Until Arrival Of _____ At _____.
3. Hold Main Track At Last Named Point.
4. Clear Main At Last Named Point.

Segment 2:

5. Proceed from _____ To _____
6. Not in Effect Until Arrival Of _____ At _____.
7. Hold Main Track At Last Named Point.
8. Clear Main At Last Named Point.

Segment 3:

9. Proceed from _____ To _____
10. Not in Effect Until Arrival Of _____ At _____.
11. Hold Main Track At Last Named Point.
12. Clear Main At Last Named Point.

TRACK WARRANTS

PART 3: Other Instructions

- Provides additional instructions to crew.
- These are not optional and must be authorized, adhered to.

Other Instructions:

13. Work between _____ & _____.
14. Joint Authority Between _____ And _____.
Note: Trains must move at RESTRICTED speed.
15. This Authority Expires at _____.
16. Do Not Foul Limits Ahead of _____, _____.
17. Do Not Exceed _____ MPH Between _____
& _____.
18. Other Special Instructions: _____

TRACK WARRANTS

PART 4: Readback and OK

OK _____, __M Disp. _____ Copied By _____

Track Warrant is now in effect!

PART 5: Cleared/Roll-up

With the understanding that all mainline track switches within the limits released are lined for the main track:

Reported Clear _____ at _____, __M By _____
(Location) (Time) (Crew Member)

Reported Clear _____ at _____, __M By _____
(Location) (Time) (Crew Member)

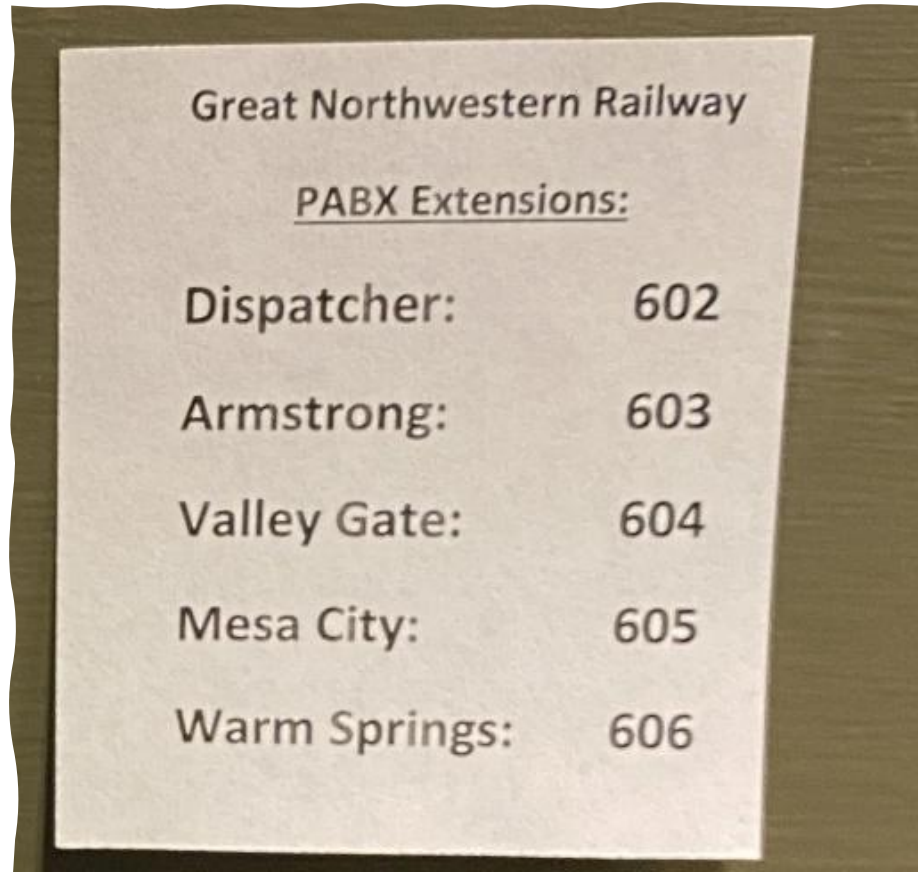
Reported Clear _____ at _____, __M By _____
(Location) (Time) (Crew Member)

PHONE SYSTEM

PABX – Private Automated Branch Exchange



- Direct communication between locations
 - True phone system, but dial tone is not same as “Bell System.”
- Yardmasters should use phones for communications
- Reference extension #'s on fascia



ABS / APB Signals

- ABS / Interlocking Signals Exist on Warm Springs Branch
- ABS: Automatic Block Signals
APB: Absolute Permissive Block
 - Indicates OCCUPANCY
 - NOT Track Authorization
- Red = Stop
- Not Red = Look at your Track Warrant

Interlocking Signals

- Interlocking Signals Exist at East El Vado Jct, Valley Gate and Armstrong
 - Provides PERMISSION to ENTER Yard Limits
 - Provides ROUTE INFORMATION leaving yard
- Entering:
 - Red: Stop
 - Lunar White: Restricted
 - Red Flashing: Restricted



Interlocking Signals (Cont'd)

- Interlocking Signals
 - Multi-Head Signals
 - Indicates ROUTE AND OCCUPANCY
 - Does NOT Convey Authority
 - Upper Head: Primary Route
 - Lower Heads: Secondary and tertiary routes
 - “Impossible” Routes always Red



YARD LIMITS

- Do not need Track Warrant for Movements Within Yard Limits
- Cannot move into Yard Limits without Yard Master Authorization.



YARD LIMITS

- YARD LIMITS DO NOT EXIST AT ARMSTRONG
 - The Main Line and Siding are under control of the Dispatcher
 - Yard tracks, ARE under ARM YM control
 - “Armstrong Tower” can override DS, but ask permission first.



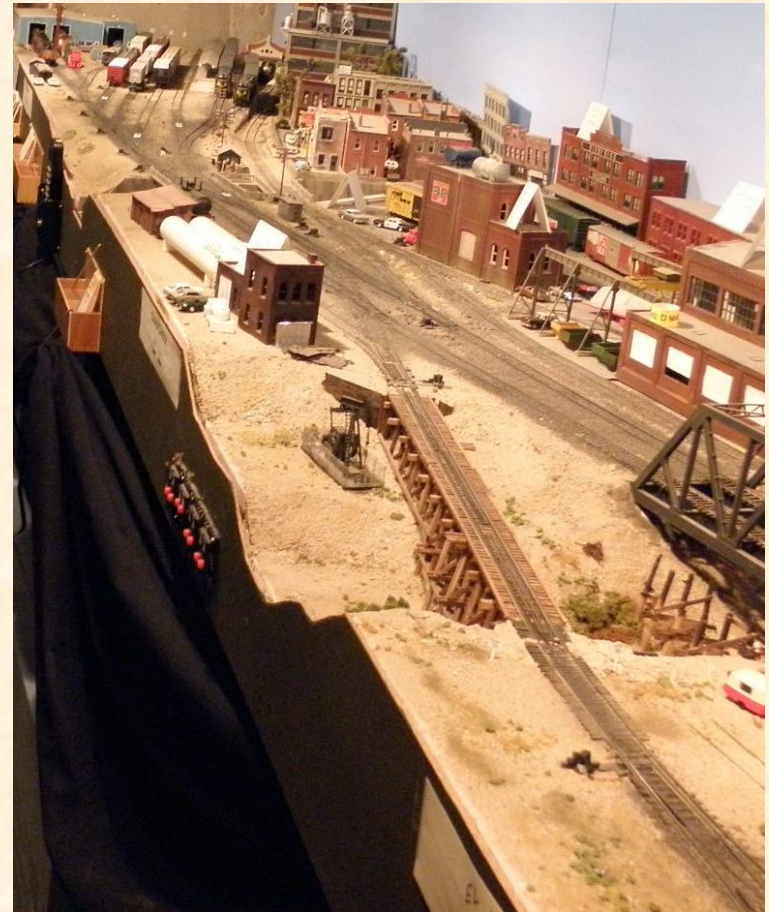
YARD LIMITS

- YARD LIMITS DO NOT EXIST AT VALLEY GATE
 - The Main Line Is Under Control of the Dispatcher
 - However, sidings, yard tracks, etc ARE under Valley Gate YM control
- Mainline Denoted by LIGHT COLOR BALLAST through Valley Gate



YARD LIMITS

- Yard Limit DO EXIST at WARM SPRINGS from El Vado to End-of-Track at Warm Springs.
- All movements within Warm Springs District are under control of Warm Springs YM.



Industrial Switchers

- Abajo Caliente has a captive switcher.
 - Limits of operation are to derail.
- Rosita interchanges with private mining Ojitas RR.
- Foreign/Private RR power not permitted to operate on GNW tracks.



GENERAL CODE
OF
OPERATING RULES
- AND -
Operator's Handbook
For The
GREAT NORTHWESTERN
RAILWAY COMPANY



OPERATING
DEPARTMENT

Revision 1

Effective December 1, 1979

For More Information

Check out the:

*Railroad General Code
of Regulations and
Operator's Handbook!*

TRAIN HANDLING

- Throttles
- Sound
- Techniques



The MRC Prodigy Handheld

- Easy to Operate
 - Instructions are on back!
- Press LOCO, type in number, and touch enter to capture a loco.

Speed control – either by “+” or “-” buttons or by knob.

- Yard Master throttles are tethered, road throttles are wireless.

Direction between + and – keys...

Railroad time

Previous Locos



Sound Equipped Loco Controls

In general:

F0 – Headlight

F1 – Bell

F2 – Long Horn

F3 – Short Horn

F4 – Dynamic Brake Sound

F5 – Gyra Light or Beacon

F6 – Backup Light

F7 – Brakes

F8 – Silence (Mute) OR **Startup** (ESU Decoders)

F9 – Dim (Headlight and B/U Light)

STOP – Shutdown – Also stops loco when moving

(See Loco cards for specifics on each engine)



A photograph of a red and blue locomotive on tracks. The red locomotive is in the foreground, and the blue one is behind it. A person in a high-visibility vest is visible in the bottom right corner. The background is a hazy, outdoor setting.

LOCOMOTIVE OPERATION

- Power is on the tracks at all times.
- Digital Carrier Control (DCC) sends signals over the rails to the loco to command actions.
- All locos are addressed by their number.
- All are sound equipped; most are Soundtraxx Tsunami. Refer to Loco Card for commands.
- All are programmed with momentum!
 - If lights and sound are on, power is getting to the unit.

MOMENTUM



- Prototype locos weight between 150 and 250 tons – they don't start and stop easily.
- Simulated within the decoders.
- Road units have more.
- Slower is better.
- Plan your moves.

SPEED

How Fast Is Fast Enough?

- 25-45 MPH on Mainline
 - Note Signage
- 10 MPH in yards



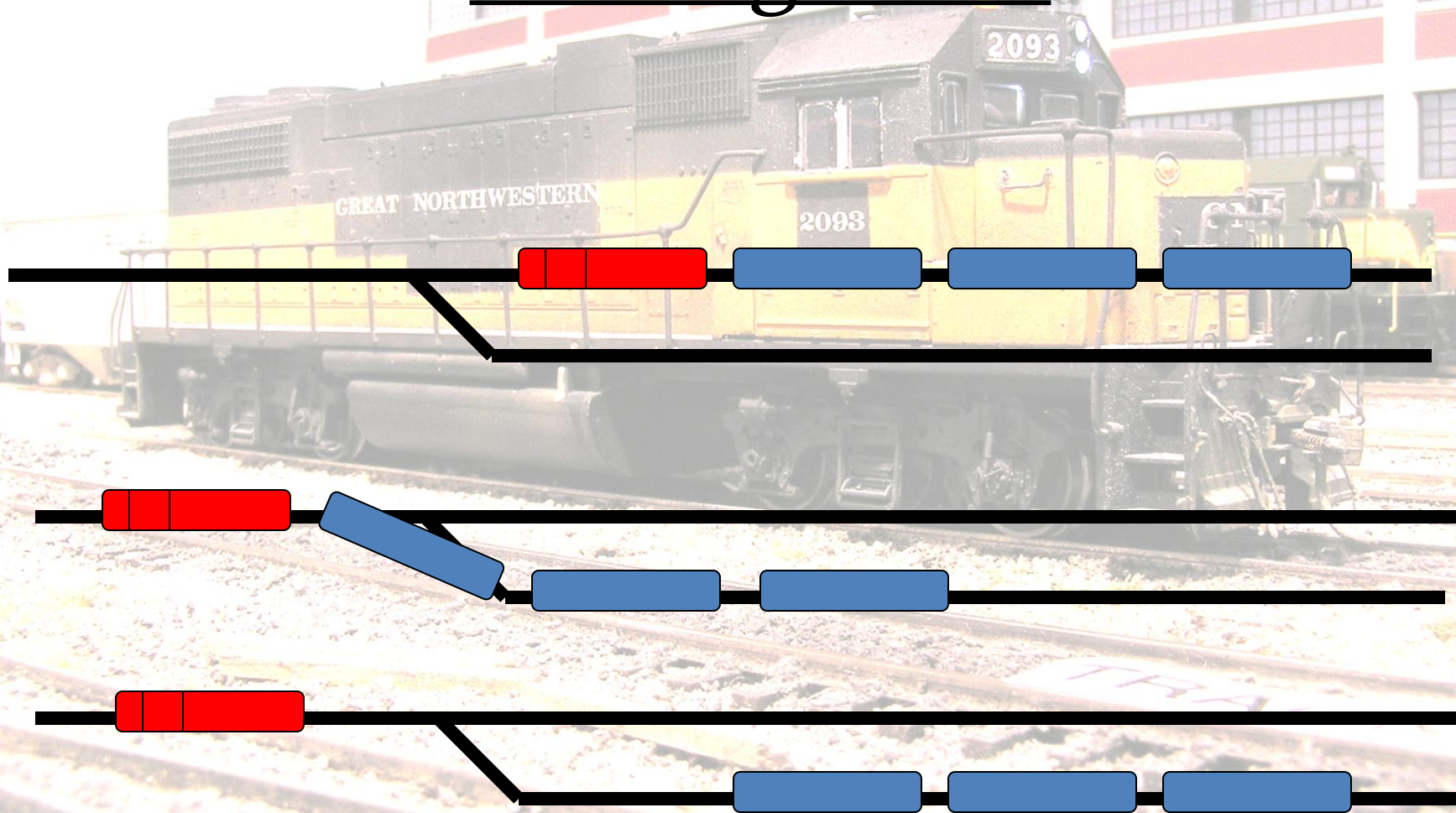
Speed Table	
MPH	Seconds per 50'
5	6.8s
10	3.4s
15	2.3s
20	1.7s
25	1.4s
30	1.1s
40	0.9s
50	0.7s
60	0.6s



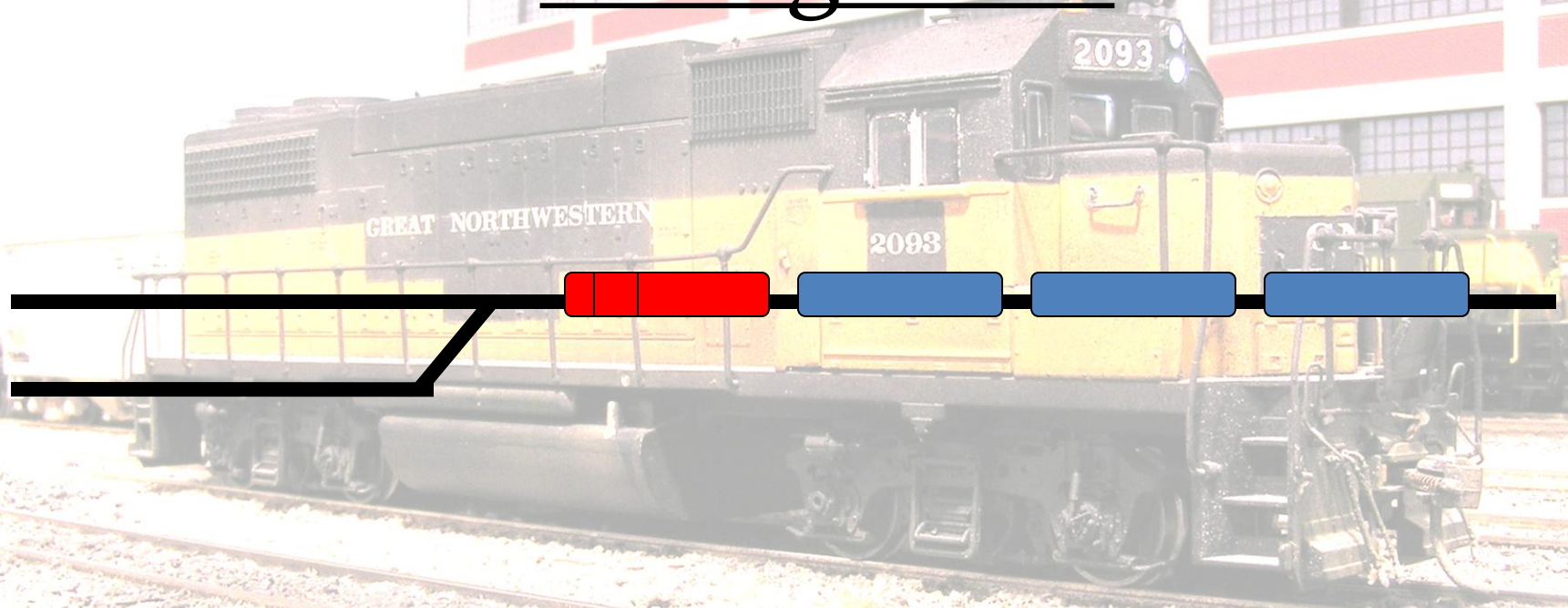
SWITCHING OPERATIONS

- Group Movements
 - Preferably work everything as a trailing point movement.
 - Group all facing point movements and make just one run-around.

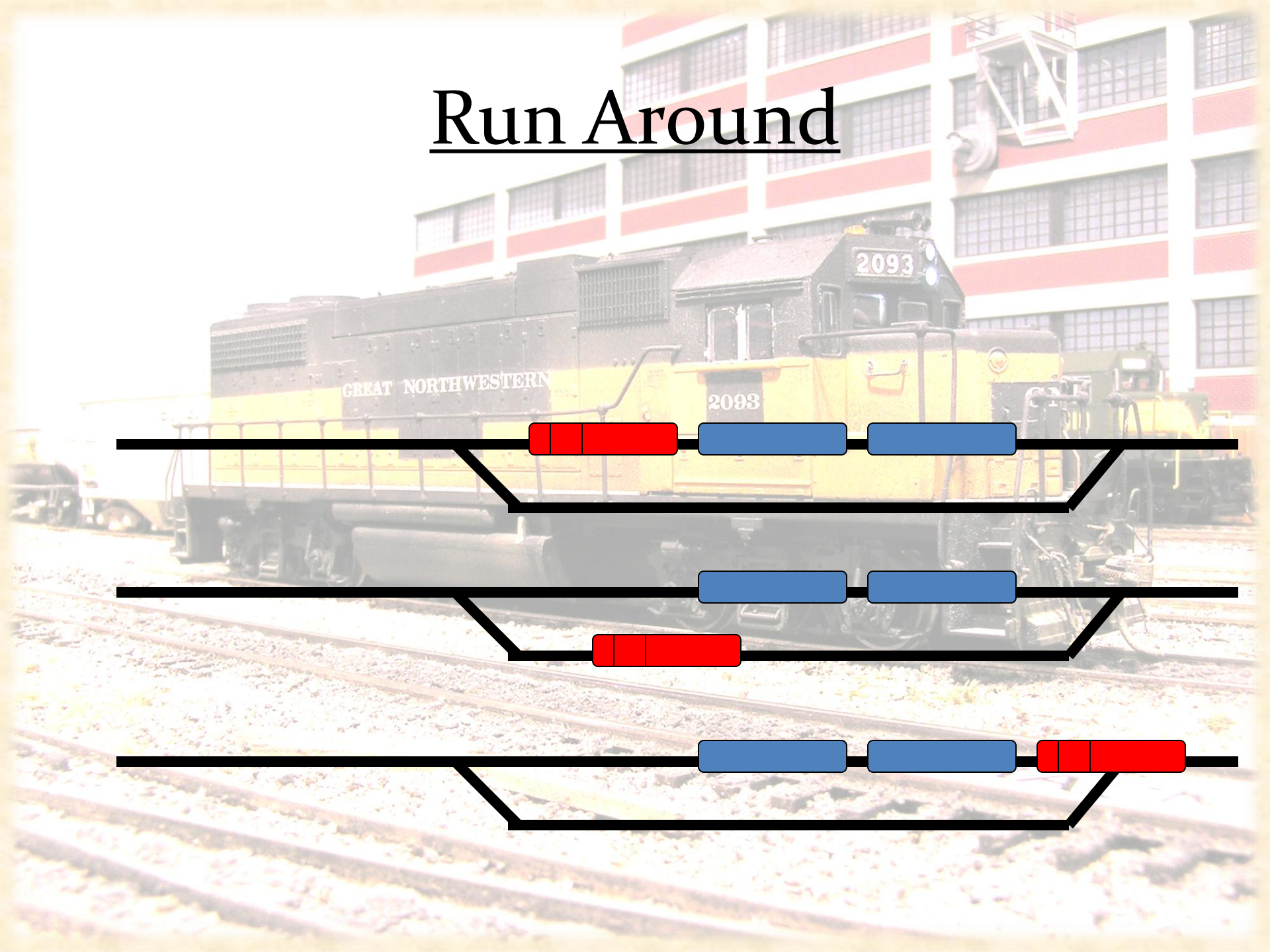
Trailing Point



Facing Point



Run Around

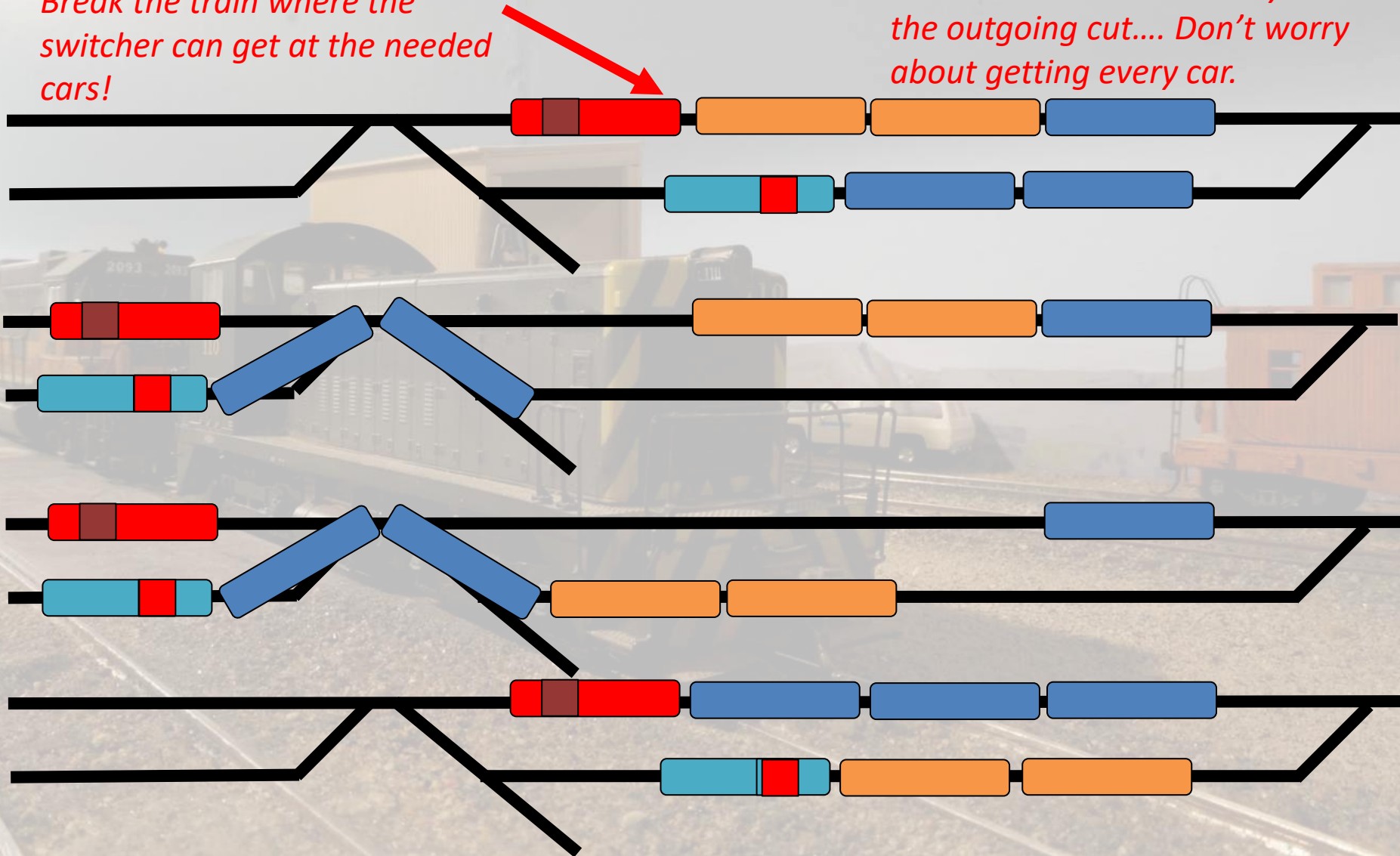


Thru Trains at Armstrong

- Should not take much time – at most 6 moves
 - Shown for Eastbound.

Break the train where the switcher can get at the needed cars!

Switcher needs to be ready with the outgoing cut.... Don't worry about getting every car.





Check – Align - Check
Reduce Derailments...



Clean up after switching...

- Return all Switches to the NORMAL or MAINLINE position.
- Leave Car-Cards in proper locations.
- Verify Train-Packs that you have correct cards.



ADDED ELEMENTS FOR REALISM

- Deliberate moves. Plan before working.
- Group facing/trailing point moves.
- Slower is better.
- Other ideas:
 - Time to pump up air in cars. Typ 1 min per car.
 - Think about where your brakeman is, and pause to drop him, pick him up, plan cuts where his is...
 - Blow Horn: Before moving, RR crossings, etc.
 - Ring Bell: Stations, engine facilities, grade crossings.

GNW MISCELLANEA

- No Food or Drinks in the RR Room
 - Water OK - We have water bottles for you!
- Tight Quarters – Make Room for each other
- Bad Order Cars –
 - Flag with Pink Slip
 - Set out at first convenient location.
- Bathroom – Next to RR entrance or upstairs
- Aprons – Available if desired
- Evening/Night Lighting



Closing Thoughts....

- *Goal is to simulate a rail transportation system in scale.*
- *Operate realistically:*
 - *Speed is not as much a factor as deliberate and safe movements.*
 - *Follow prototype practices as much as possible.*
- *Have fun!*



