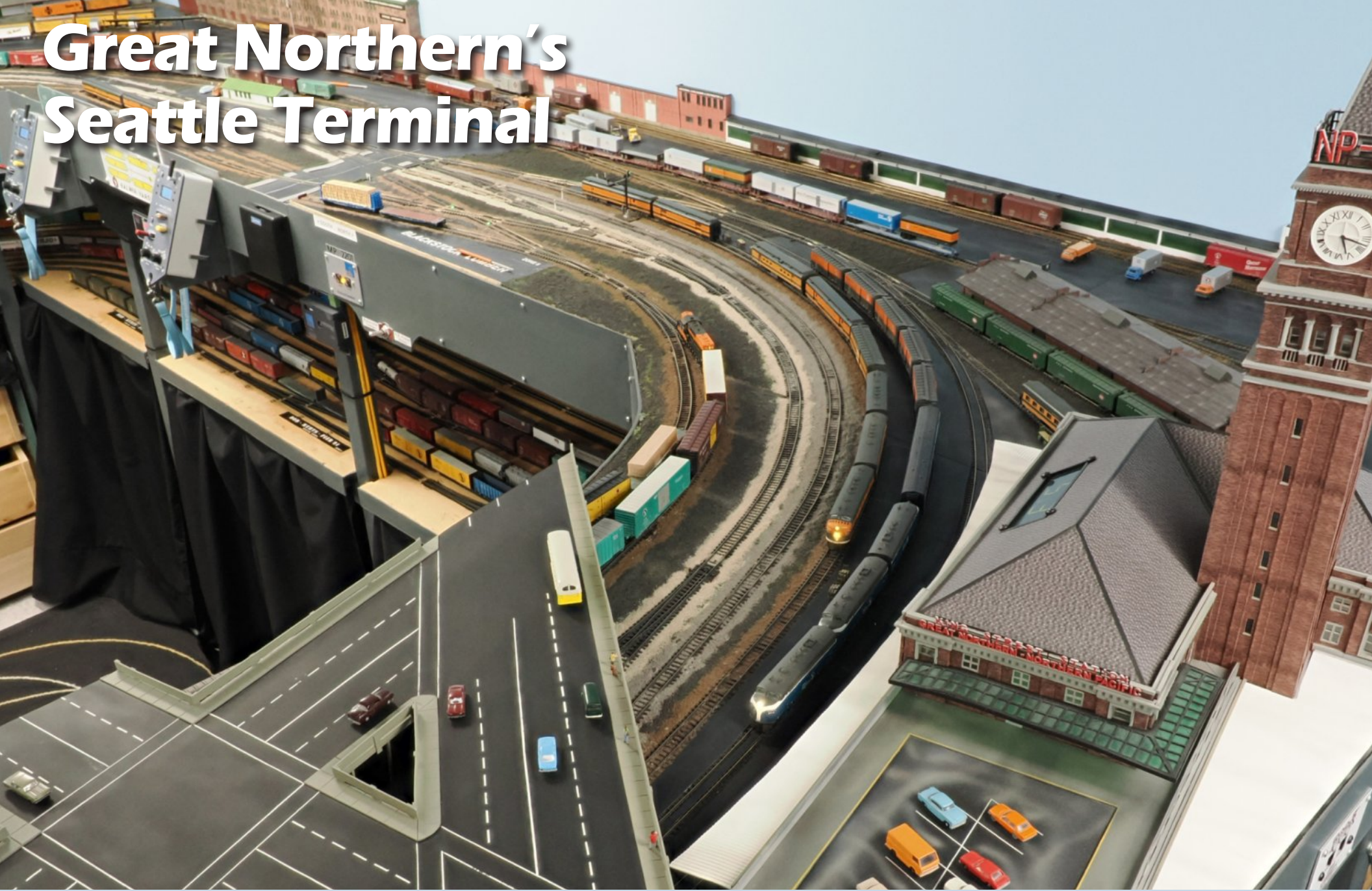


Great Northern's Seattle Terminal



BRIAN MORGAN INTRODUCES HIS LAYOUT ...

1. King Street Station and its freight houses are the focal point for my switching layout.

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I HAVE 50 YEARS' EXPERIENCE AS A MODEL

RAILROADER. In June 2015, I was well on my way to completing my large N scale Burlington Northern layout when I returned home from vacation to a flooded basement.

The restoration company gave me three days to empty the basement. My only option was to cut up my layout and retreat to the garage to salvage what I could.

Forced to make a fresh start, I decided this was an opportunity to future-proof the layout for when we might decide to downsize our home. A switching terminal railroad was more suited to an eventual smaller space (11'x12'), but would still offer lots of operation for multiple people.

Since I had always wanted to model the King Street Station (KSS), the Seattle's South of Downtown (SoDo) neighborhood was the logical choice [1]. I decided to change my era slightly, from 1970 Burlington Northern to 1967 Great Northern, to maximize the mail, LCL (Less than Car Load) and passenger train traffic, since in the fall of 1967, most of the U.S. mail had shifted from railways to airlines.

THE BACKGROUND

In the early 1900s, the city of Seattle wanted a belt railway to serve its port. The railways resisted, and it went to court. In 1919, Seattle was divided into 13 switching zones, assigned among the competing railroads. Each was required to provide reciprocal switching.

In 1967, KSS still saw 16 passenger train departures/arrivals per day. The Railway Express Agency, numerous LCL freight forwarders, and freight houses of the competing railways occupied the area immediately behind the KSS.

- The KSS is located at the South Portal of GN's Seattle Tunnel, which allowed trains to travel under the downtown, and was the start of the SoDo neighborhood. At this time, the SoDo neighborhood was 100% industrial, and included a large portion of the port.

As part of my research, I came across a newspaper article, "Box Car Shortage Serious? Ask Any Mill Operator," from the March 20, 1966 edition of the *Eugene Register-Guard*. I learned the area's plywood mills were not designed to hold inventory. As plywood was made, it was loaded in boxcars, and the boxcars were essentially used as warehouses on wheels.

When Eastern railroads did not promptly return empty boxcars to the West, the mills were forced to shut down. The railroads were under fire from both the mills and government officials.

Plywood mills got switched more than once daily, and Seattle had numerous plywood mills and other industries that needed a steady flow of cars.

In this era, boxcars carried just about everything. Perfect – that's the kind of industries I wanted. I already had a lot of boxcars, including double-door cars which were commonly loaded with plywood/lumber.

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CAR CLASSIFICATION AND SWITCH LISTS

Since this was to be a switching layout, I abandoned my previous colored-dot method of indicating where a car was to be delivered. Instead, I incorporated the variety of strategies local railroad offices and shippers used in 1967.

1. A *flow commodity* was a material that was received regularly enough that a receiving industry could provide the railroad with *standing instructions* to spot it.
2. The "On Arrival" method allowed the shipper to call the railroad while the car was on the road and give specific instructions on where to spot the car when it arrived.
3. Alternatively, a railroad clerk called the receiving industry to inform them that a specific car had arrived and ask where they would like it spotted.
4. Lastly, a cut of cars could be delivered for an industry and the loading dock foreman would instruct the switch crew where to spot the cars.

To efficiently identify car types, GN used the "General Superintendent of Transportation Codes" to describe rolling stock. For example, a 40-foot boxcar with a six-foot door opening was a B2. A 40-foot boxcar with a door opening greater than 12 feet was a B8. Forty-foot boxcars were given even numbers; 50-foot boxcars had odd numbers [2].

These codes were brief, effective, and easy for the railroad employees and '60s-era computers. The Northern Pacific also used these codes; I suspect so would have the CB&Q and SP&S. They were used well past the BN merger date.

The Great Northern Seattle Terminal was designed for operation, with a focus on moving railroad cars the last few miles to their destinations. Using switch lists for my car forwarding scheme allowed for the variety I wanted. It also realistically slowed things down.

My pocket-sized switch lists are replicas of Great Northern Railway's, printed on 110-pound yellow paper. I intended them for single use, so operators can mark them up as needed [3].

I use DCC, and my locomotives are each set with heavy momentum and with braking function. To switch effectively, you must keep speed under 10 MPH. Each operator uses a single GP7 engine with a ProtoThrottle, which has been ideal for my requirements.

It's not how fast the locomotive runs, but rather getting things done in the fewest switching moves that counts. To keep true to a prototype railroad, I have avoided switching puzzles.

THE LAYOUT PLAN

My layout has two levels: the lower staging area at 29 inches in height and the upper operating level at 46 inches [4, 5]. My plan was to design it with six switching zones. Each zone requires different strategies to successfully switch it, and this makes a more challenging layout with a greater variety of industries.

Zone 1 has industries that feature flow commodities, a plywood mill, and a large flour mill [6].

| | | | | | |
|----|------------------------------------|----|-------------------------------|----|-------------------------------------|
| B1 | 50' Box w/6' Door Opening | F2 | Bi Level Auto Rack | HS | Hart Selective |
| B2 | 40' Box w/6' Door Opening | F3 | Tri Level Auto Rack | MW | Maintenace Of Way |
| B3 | 50' Box w/8' Door Opening | F4 | 40' Flat | PB | Passenger Box |
| B4 | 40' Box w/8' Door Opening | F5 | 50' Flat | PR | Passenger Refrigerator |
| B5 | 50' Box w/10-12' Door Opening | F6 | 60' Flat | P5 | Mail Car Passenger |
| B6 | 40' Box w/10-12' Door Opening | F7 | Piggyback Flat, Less than 89' | PE | Passenger ALL Others |
| B7 | 50' Box w/Door Opening > 12' | F8 | Piggyback Flat, 89' and Over | R2 | Reefer w/Ice Bunkers |
| B8 | 40' Box w/Door Opening > 12' | F9 | Articulated Flat | R3 | Mechanical Reefer |
| B9 | 60' and Longer Box | FL | Log car | R5 | Insulated Box |
| BD | 40' Box w/Load restraining Devices | FS | Special Service (well) Flat | R8 | Bulk Potatoe |
| BE | 50' Box w/Load restraining Devices | G1 | 50' Gondola | R9 | 60' and Longer - - Insulated Box |
| BG | Box w/Grain Access Doors | G2 | 40' Gondola | RR | Reefer w/Racks - Rails |
| C2 | 2 Bay Covered Hopper | G3 | 60' Gondola | S3 | Stock, Single Deck |
| C4 | Covered Hopper < 4000 C.F. | GC | Covered Gondola | S4 | Stock, Double Deck |
| C6 | Jumbo Covered Hopper | H1 | Ore Car | T | Tank |
| CA | Airslide Covered Hopper | H4 | Triple Hopper | WC | Wood Chip |
| F1 | Bulkhead Flats | H6 | Quad Hopper | | |

GN SoDo

2. General Superintendent of Transportation Codes as used by the Hill Lines.

| A-AUTO CARS | | F-ENGINE IN TOW | | H-HOPPERS AND ORE | | R-REFRIG. CARS | | W-WORK AID | |
|-------------|---------|-----------------|---------------------|--------------------|------|----------------|--|------------|--|
| B-BOX | | F-FLAT | | L-COVERED HOPPERS | | S-STOCK | | OUTFIT | |
| C-CABOOSE | | G-GONDOLAS | | P-PASSENGER EQUIP. | | T-TANK | | EQUIPMENT | |
| FROM/TO | DATE | TIME | TRAIN OR ENGINE NO. | | | | | | |
| 56/1 | 8/26/67 | | M 606 | | | | | | |
| COND. | | | | CHECKER | | | | | |
| INITIAL | NUMBER | CL | CONTENTS | FROM | DOOR | | | | |
| 1 | NP | 558 | B7 NEEM | SPOT | | | | | |
| 2 | MILW | 9527 | B8 | " | | | | | |
| 3 | MILW | 9508 | B8 | " | | | | | |
| 4 | UTX | 266 | T | | | | | | |
| 5 | CGTX | 090 | T | | | | | | |
| 6 | | 468 | B8 | MTY | | | | | |
| 7 | | 000 | B8 | " | | | | | |
| 8 | | 3008 | B8 | " | | | | | |
| 9 | | 3512 | B8 | " | | | | | |
| 10 | | 877 | B8 | " | | | | | |
| 11 | | 3004 | B8 | " | | | | | |
| 12 | | 3477 | B8 | " | | | | | |
| 13 | NP | 8289 | B8 | MTY | ↓ | | | | |
| 14 | GATX | 536 | T | " | PULL | | | | |
| 15 | WRNX | 2205 | T | " | | | | | |
| 16 | Q | 549 | B8 | PLWD | | | | | |
| 17 | | 4000 | B8 | " | | | | | |
| 18 | | 3472 | B8 | " | | | | | |
| 19 | | 234 | B8 | " | | | | | |
| 20 | | 176 | B8 | " | | | | | |
| 21 | | 449 | B8 | " | | | | | |
| 22 | | 3763 | B8 | " | | | | | |
| 23 | | 499 | B7 | PLWD | OVER | | | | |

FED PLYWOOD

3. A replica Great Northern Railway switch list. Since most of my cars are GN, I do not mark "GN" in the recording marks column. While most of the prototype switch lists I have seen are brief, I fill mine with much more detailed information.

Zones 2 and 3 feature food commodities, a brewery, and a large grocery distributor.

Zone 4 has the LCL freight houses, with cars being spotted by door number.

Zone 5 has a variety of smaller industries, and splits time switching KSS and the Postal Annex.

Zone 6 (on lower staging level) simulates Pier 91, but has not been run so far.

A zone (or zone 2 & 3 together) can keep one operator busy for a two-hour operating session. I also played to N scale's strength of allowing large scenes to represent large industries, versus many small ones.

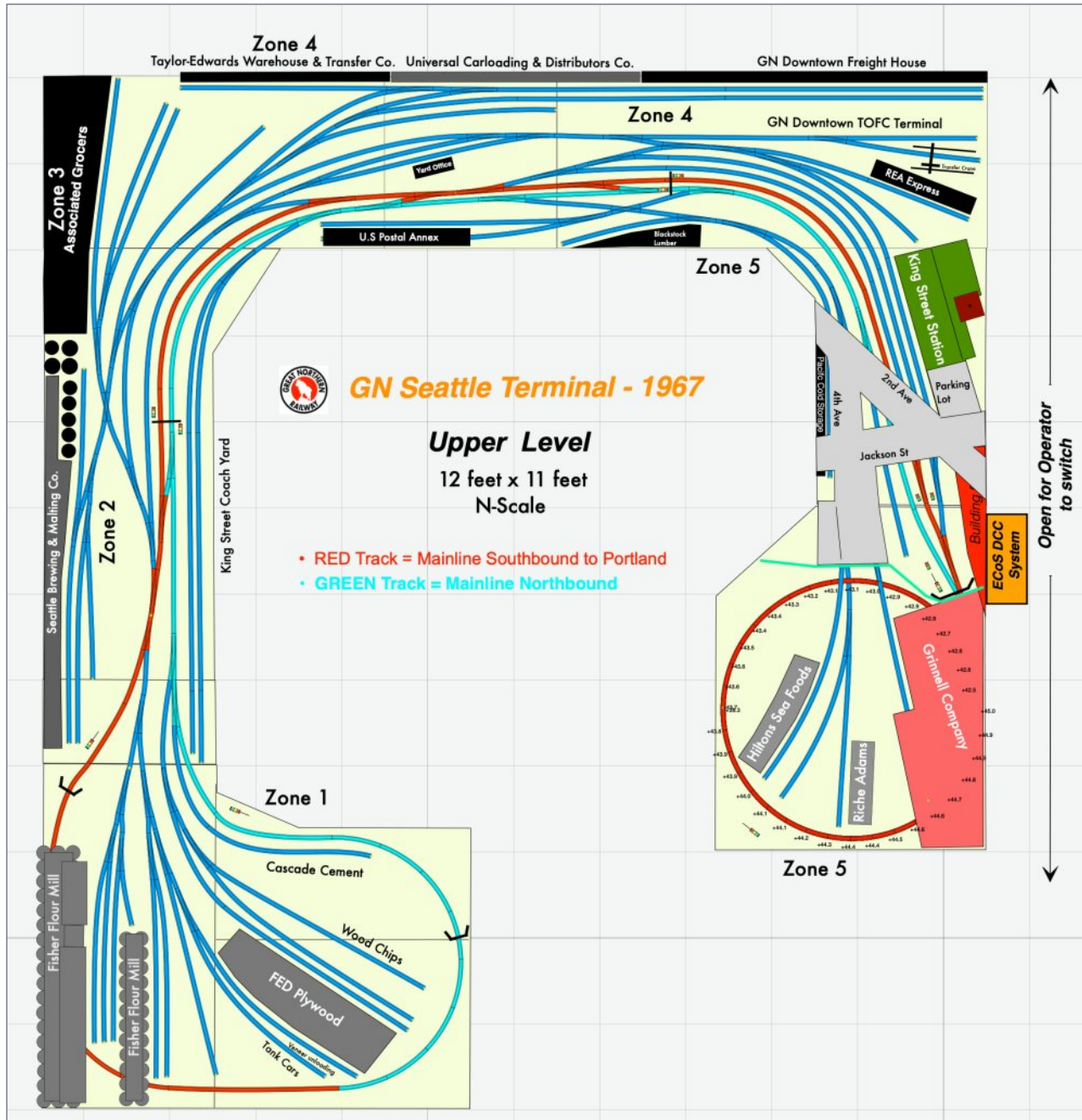
Thankfully, I was able to repurpose many of the industries salvaged from my previous layout. Seattle's King Street Station (KSS) was a major construction project and is a focal point.

SETTING UP THE OP-SESSION

I make the op-session setup as fast and easy as possible. I need the correct type of cars, in the correct quantities, to be delivered to each industry. For this layout, I made up a Block to Track Table job aid [7].

The lower level of the GN Seattle Terminal represents Interbay, location of Great Northern's principal yard in Seattle, Balmer yard. While sitting in a chair, using my Block to Track Table, I can quickly five-finger the blocks of cars for each Switching Zone.

This job aid lists the type & quantity of cars for each industry, grouped by zone, in sequence order. The right side of my Block to Track Table represents the Helix side of the layout. The number on the right in the red circle is the absolute maximum number of cars. In practice, I like to be a few cars less than the maximum. I incorporated the General Superintendent of Transportation Codes [2] to describe the rolling stock I need.



4. GN Seattle Terminal-1967 upper level, with switching zones 1-5.



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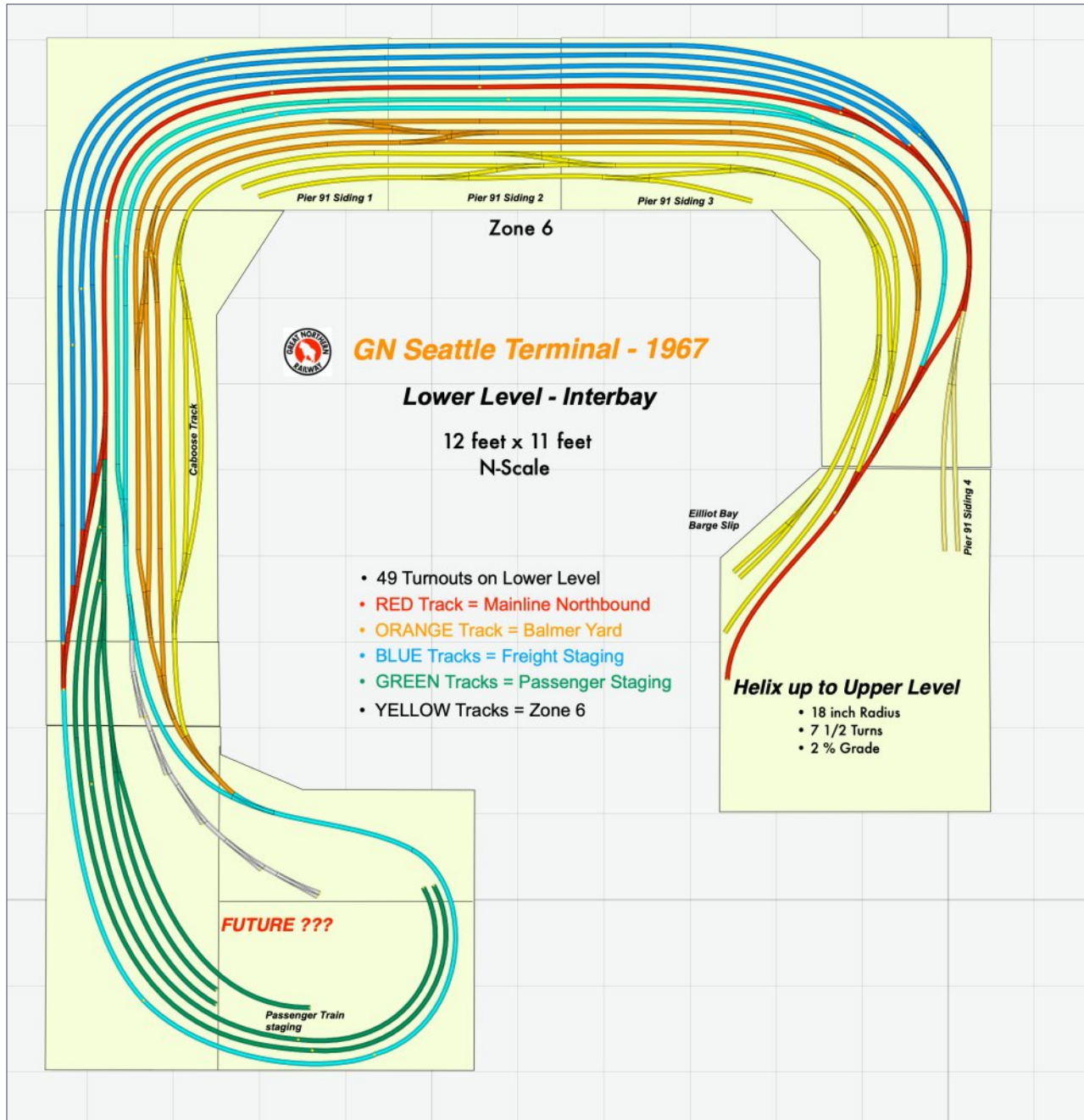


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5. GN Seattle Terminal-1967 lower level, with switching zone 6 and staging.



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STAGING

The layout's lower staging level is a critical part of the layout. Staging allows trains to come onto and off of the layout easily, as needed. At times, I participate in multi day op-session events.

Because I have ample staging, I can pre-stage several days' worth of op-sessions ahead of time. If I were to fill up 100% of my freight train staging, it would hold 338 40-foot cars, plus there's staging for five passenger trains. My typical freight train has 30 40-foot cars with locomotives.



6. Switching Zone 1, from left to right, Cascade Cement, FED Plywood, and Fisher Flouring Mill. The elevated stand holds a copy of the track maps book and a lineup of the trains that will be run during this shift, making them easy to read, and freeing up the operators' hands.

To manage staging, I depend on my ESU ECoS DCC command station [8]. Using the ECoS's touch screen allows me to see all of my staging turnouts and track occupancy at a single glance. If needed I can change the ECoS display for a detailed description of each train using the ESU's Railcom technology.

OPERATING SESSIONS

On my previous BN Selkirk Division layout, I ran a sequential timetable. Time was not considered, and train orders were verbal via five-channel radios. For my much smaller Seattle Terminal layout, I wanted to use time to set a tempo.

In 1967, GN's freight trains all ran as extras, and only first-class passenger trains still ran by timetable. By adding time, the KSS (Zone 5) operator would know when a passenger train should be departing. Time could also be used for inbound passenger trains running up to KSS from the staging level [9].

| BALMER YARD | | | | | Your RIGHT | | | | |
|----------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------|-------------------------------|------------|--------------------------|----|
| BLOCK to TRACK TABLE | | | | | GN SoDo | | | | |
| ZONE 1 | Fisher Flour B2's - Sacked Flour 4-6 | Fisher Flour CA's 1-2 | Fisher Flour C6's & B2's Grain I.B. 3-4 5-6 | Cascade C2's | FED-Ply Wood Chip 2 | FED-Ply B7's & B8's 5-8 | T's 2 | FED-Ply Veneer 3-4 | 29 |
| ZONE 2 | Rainier Beer Inbound - Glass Bottles, Cardboard, Cans & Kegs B5's & B3's & B4's & B8's 5-6 | Beer - Malt, Hops, Corn C6's 2-3 | BEER Out R5's 2-5 | Tank Cars - Corn Syrup T's Blue 1-3 | 14 | | | | |
| ZONE 3 | Associated Grocers Packaged Food, Frozen Food & Consumer Goods B5's, B7's, R5's & R3's 4-6 | Produce - Tracks 2 & 3 R2's 5-8 | Meat - Track 4 R2's 1-3 | 11 | | | | | |
| ZONE 4 | Taylor-Edwards Warehousing B5's, B4's, B2's & R5's 4-6 | TOFC F7 / F8 & Heavy Lift F7's & F8's / G's 1-3 1-3 | GN's 2-3 | GN Freighthouse B2's & @ times R2's 6 or So | Universal Carloading B2's & @ times R2's 4-7 | 19 | 12 boxcars | | |
| ZONE 5 | Riche Adams R2's 1-3 | Ginnell Co. G's of pipe / B's 2-4 | Hilton Sea Foods R5's, B5's 3-5 | Blackstock Lumber B8's, F1's & F5's 1-3 | Pacific Cold Storage R2's 2-4 | 14 | | | |

7. The Block to Track Table I use when making up cuts of cars on the staging level for each switching zone. Occasionally, I have used a switcher loco to assemble each block, but my five-finger switcher is significantly faster.



8. ESU's ECoS DCC Command Station (lower left) has a screen display that's handy for monitoring the turnouts in staging.

| FIRST CLASS | | King Street Station Line Up | | FIRST CLASS | |
|--------------|--------------------------------------------------------|---------------------------------------------|-------------------|-------------|----------------------|
| 27 | SWG 2/671 | STATIONS | LOCAL 3/672 | 360 | 6 TOFC |
| 11.13 | A 10.30 | Interbay | L 6:20 PM | 4.23 | 6.19 10.17 |
| A 11.30 PM | 9.00 PM | King Street Station | 6.35 PM | L 4.05 PM | L 6.00 PM L 10.00 PM |
| ARRIVALS | | DEPARTURES | | | |
| Western Star | From Portland 2nd set of transfer cars to Balmer | To Portland transfer cars from Balmer | The International | The PIG | Western Star |

9. KSS Evening Shift Train Lineup: The train lineup consists of a Departure side and an Arrivals side. First-class trains are expected to depart on time. However, freight trains may experience delays. To ensure the safety of first-class passengers, it is crucial to keep switch jobs clear of the trains. This necessitates the use of a clock to monitor the train's movements.

Iowa Scaled Engineering made the fast clocks I use. You can have three preset start times, time can be put on hold with the push of a button, and you can display real time.

The layout has two wireless fast clock displays. One is in the Rainer Brewery building, the other in the KSS roof. Additionally, the time is displayed in each ProtoThrottle's LCD display.

The primary job on the GN Seattle Terminal is *Switch Foreman*. The switch foreman is in charge of a switching crew working one of three shifts, each of which has a different switching emphasis.

During a day shift, KSS is busy with passenger trains and Zone 1's flow commodities will need to be switched regularly. The evening shift switches Zone 1, while Zones 4 and 5 collect mail, express and TOFC cars for "The Pig," a scheduled medium-distance freight train to Spokane meant to compete with the trucking industry.

KSS also receives the Western Star late in the shift. The graveyard shift switches Zones 2 and 3, and gets KSS ready for the next day, including switching the just arrived Western Star.

There are standing instructions for the flow commodities for each shift. Occasionally, there will be instructions from a loading dock foreman or clerk [10].

Each operator will also be provided with a small pocket-sized book containing brief instructions and track maps in the order of the Switching Zone [11].

I know when things are going well; the layout room gets quiet as the operating session hums. Some of the operating scenes are in [12-17].

I've added an extra track or two to give each zone's switching crew some room, but as the op-session progresses, that will not be enough. We will need to initiate a transfer run from KSS to Interbay (a Tramp job).

Once a Tramp is started, each zone can bring a block of pulled cars to the KSS [18]. This keeps the flow of switching on track

and encourages interaction between operators. In addition, north bound freight trains arriving from Portland, can pick up blocks of cars as they proceed to Interbay.

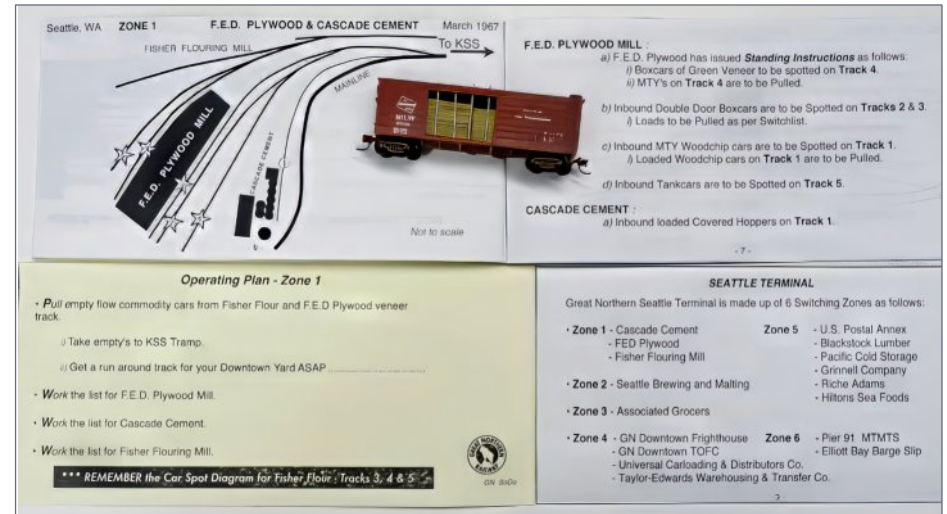
CONCLUSION

On my former basement-sized BN Selkirk Division, nothing moved between operating sessions. With my smaller layout, I can actually run it by myself, one job after another. It might take a few days to finish switching one zone, but I enjoy the variety.

The ideal crew size is three. If someone cancels, we simply run short. The diversity and challenges of a switching layout have provided a flexibility my previous empire never could! ☑



10. To enhance interaction between operators working in close proximity, an occasional instruction from a loading dock foreman adds variety and enjoyment.



11. An example from the booklet of track maps. Each zone will have an "Operating Plan," which provides concise instructions on how to proceed. These aids are designed to be easily accommodated in a back pocket.



12. Zone 1 crew members going on shift with GN 606. Universal Carloading, an LCL freight forwarder, is in the background.



13. Looking south, King Street Station just after 4PM. On the far left is Zone 5's GP7 locomotive pushing a four-car cut. The Zone 5 job splits its time with running King Street Station. Tonight, the GN Orange & Green F-Units will

power the Western Star's 10 PM departure. The GN Big Sky Blue F-Units are assigned to the "Pig" to Spokane, with a scheduled departure at 6PM. In 1967, GN had a downtown TOFC facility right behind KSS running alongside its freight house. Just under the KSS awning is tonight's Northbound International to Vancouver, British Columbia, departing at 4:05 PM.



14. Zone 4, GN 612 pulls the Great Northern freight house. Several of these cars are required for tonight's Pig. In this era, a brakeman would use chalk to mark a car as needed, I use stick-on color dots for this purpose.



15. The left two tracks represent KSS Coach Yard. The third track from the left is the Northbound main track, the fourth is the Southbound track. The next 2 tracks represent the downtown yard. Further to the right is Rainier Brewery. The crossover track features

green LED lights controlled by a DPDT toggle switch. This switch determines the polarity of the track, and sets the LEDs to reflect that. GN 606 (foreground) will be pushing cars into Zone 1. There is a plexiglass barrier at far left to prevent stray coaches from falling over the edge in case of derailment.



16. GN 606 will initially switch the Federal Plywood Mill. The most prevalent car for plywood on the GN in 1967 was a B8.



17. GN Seattle Terminal as you walk into my 11' x 12' N scale layout. The lower level is staging which connects via a helix to the upper level representing the Seattle SoDo neighborhood. On the left is Zone 1. In the middle is Zone 2's Seattle Brewing & Malting Co. known for its Rainier Beer.

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BRIAN MORGAN



Brian has had a life-long interest in trains, which likely started with numerous family trips on trains in the 1950s.

His first model train was a Revell HO set for Christmas, and in his early twenties he returned to model railroading, this time, in N scale. From there he never stopped.

The GN Seattle Terminal is his 4th N scale layout.

He is now retired with his wife, living near Vancouver B.C. He enjoys their grandchildren, and hosting op-sessions on his layout. ■



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VIEW READER COMMENTS

18. Observing the Seattle Tunnel's south portal directly in front of us, this evening's Western Star's lead F-Unit is visible. To the right, the Tramp prepares to make a transfer run with cars from the SoDo district to Interbay.