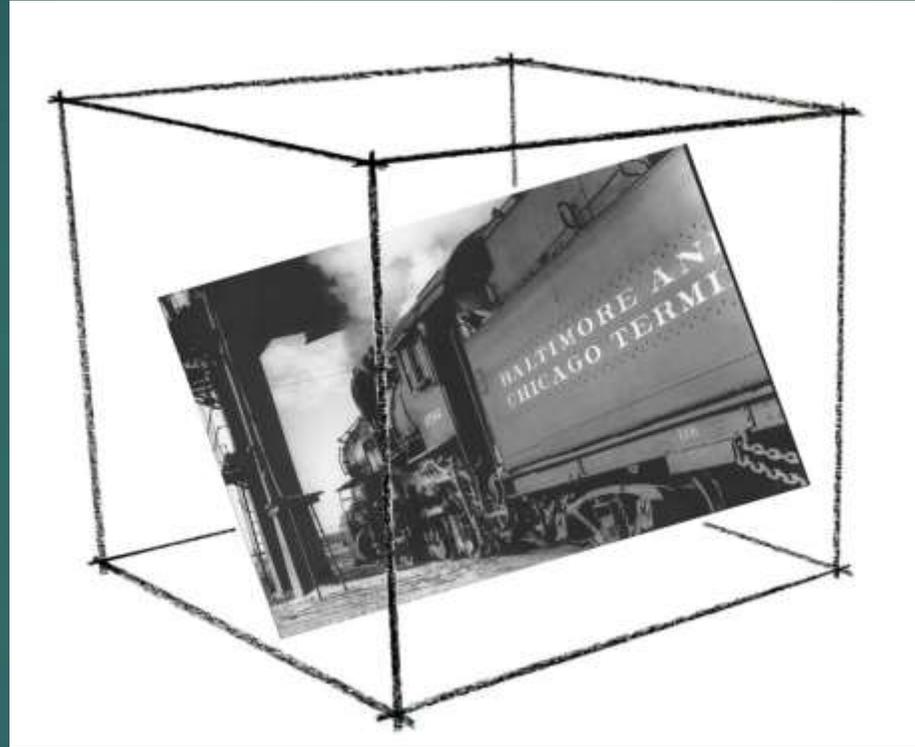


# Thinking Outside the Box



## The B&O Chicago Terminal RR

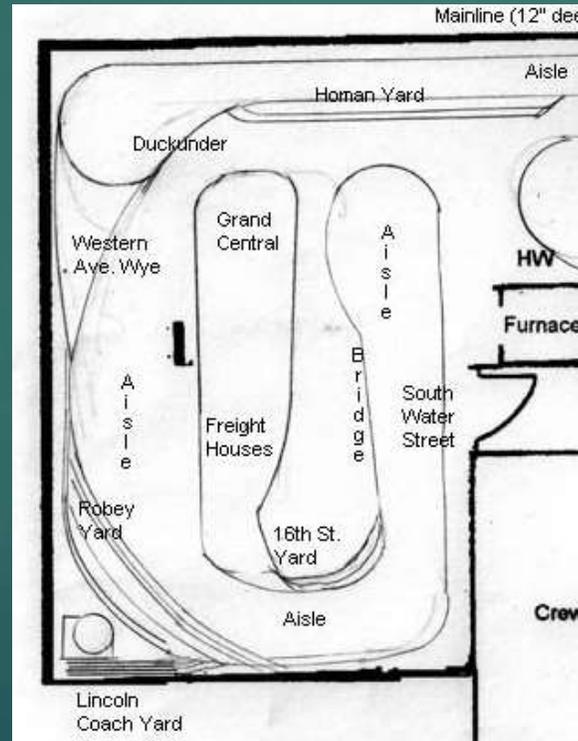
Presented by Henry Freeman – NMRA Palmetto Division – Greer, SC – March, 11, 2017

# What we will we cover

## Railroad Choice



## Planning Process



## Construction



# Special Thanks

- ▶ Mark Guiffre: Motive Power
- ▶ Mike Jensen: Electrical, Turnout Standards
- ▶ Jon Judd: Track
- ▶ Allen Keller: 63<sup>rd</sup> St. Station
- ▶ Lee Nicholas: Inspiration, Car Routing System
- ▶ Bill Raymond: CAD Design, Bridge Construction
- ▶ Herb Weiss: Structures
- ▶ Scott Griffith: B&OCT
- ▶ Baltimore & Ohio Railroad Historical Society
- ▶ Countless More for Their Knowledge and Inspiration



Mike Jensen working his magic

# Looking for a New Layout

Givens: It will be B&O related and set in 1956

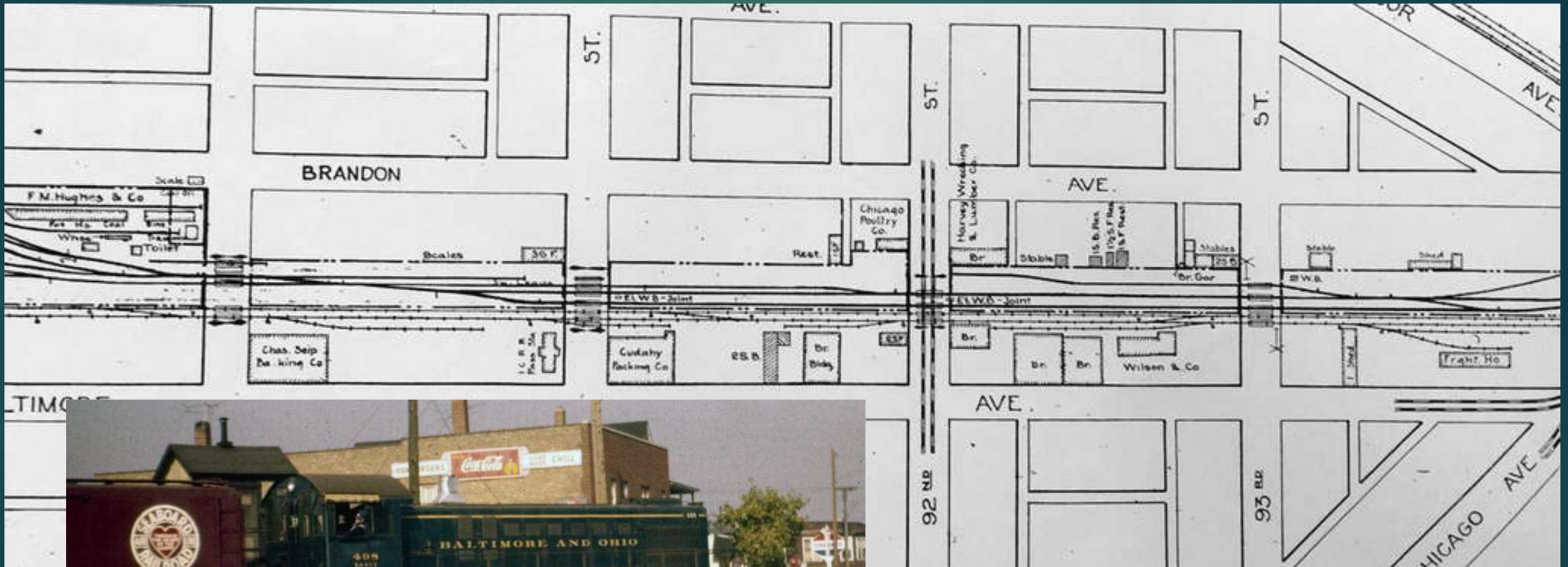


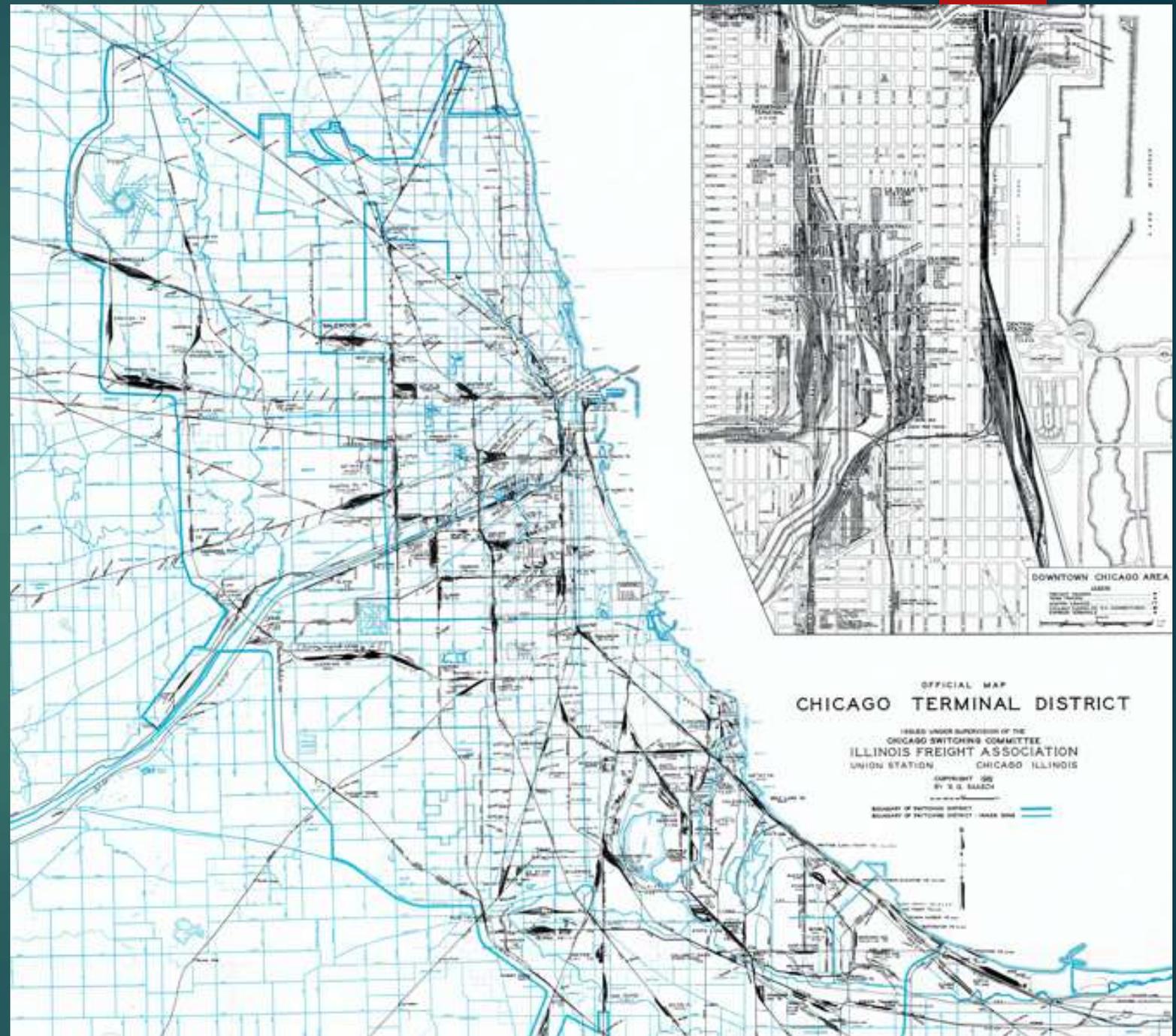
Photo by Louis Rague

Is Chicago an Answer?

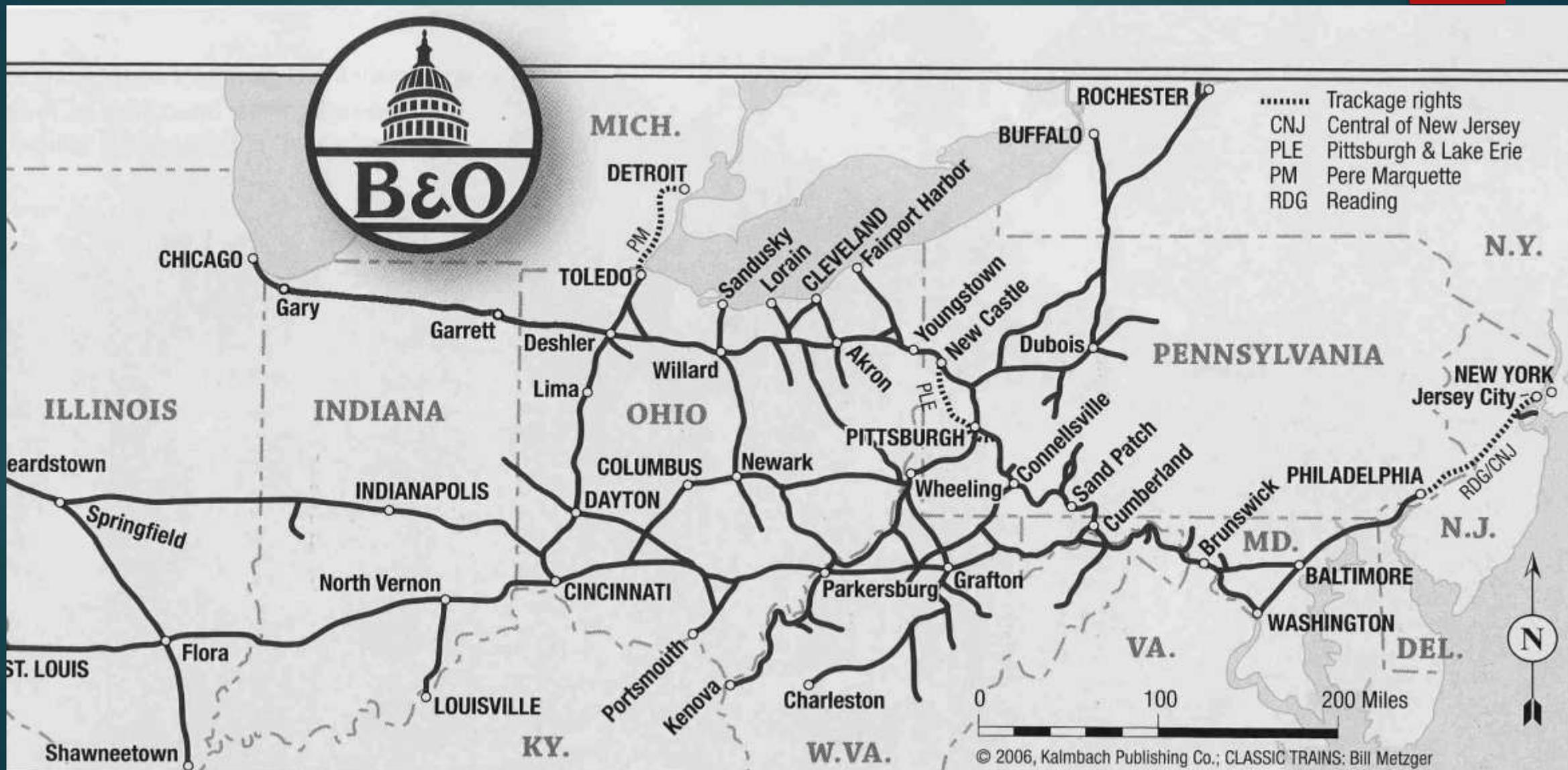
# Chicago

## Where East Meets West

- ▶ City of Interchange
- ▶ 37 long-distance railroad lines, operated by 21 independent railroad companies
- ▶ 1,200 trains a day
- ▶ Terminal, short line & industrial switching railroads
- ▶ 200 interlocking towers
- ▶ 6 downtown passenger stations
- ▶ Union Stock Yards
- ▶ Chicago Produce Terminal
- ▶ Multiple classification yards



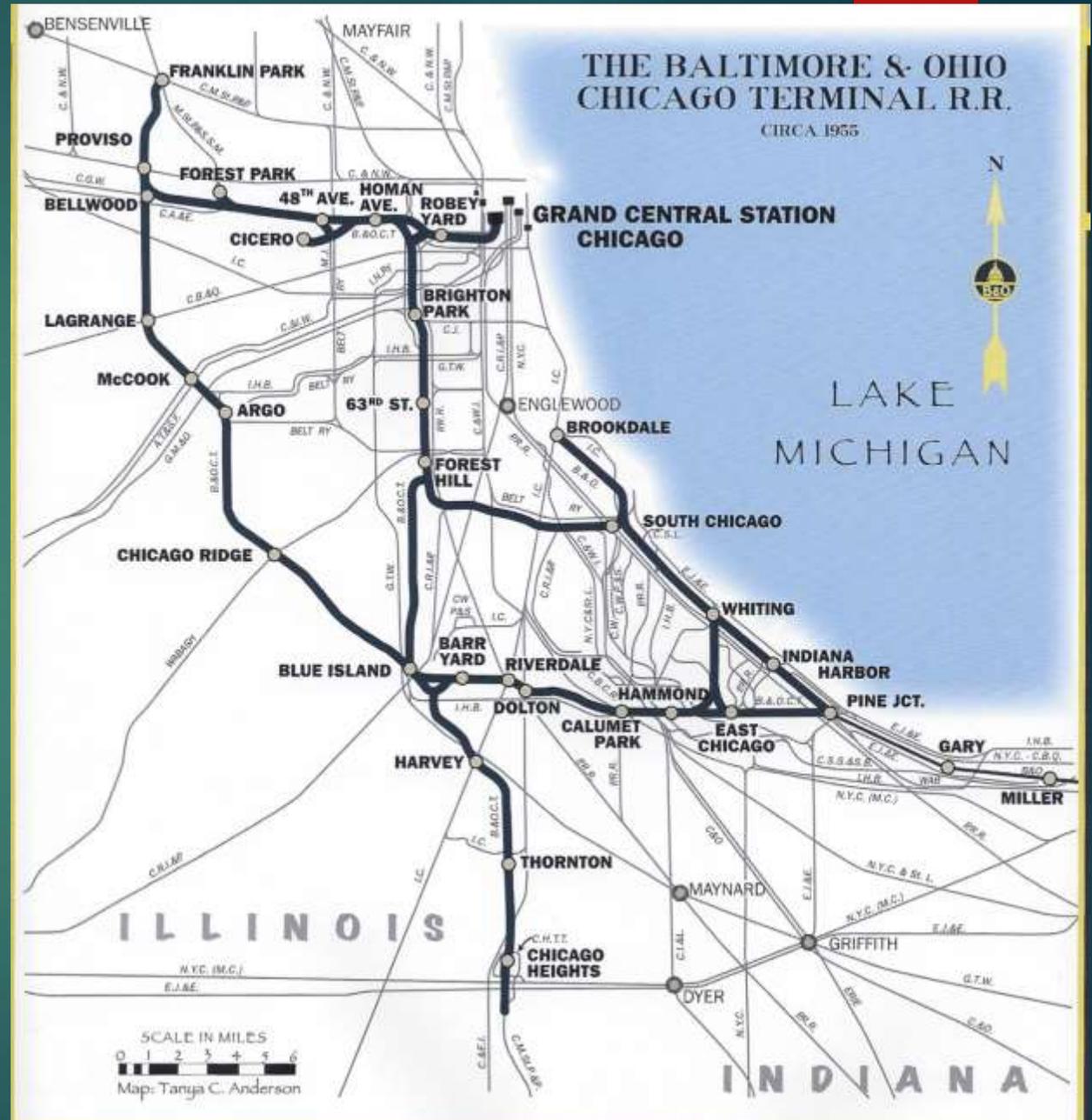
# Don't Know Chicago; Don't Know the B&O



# Baltimore & Ohio Chicago Terminal

- ▶ B&O acquired the Chicago Terminal Transfer Railroad Co. in 1910 in a receivership sale
- ▶ As an Intermediate Shipper, it is still operated by CSX
- ▶ Owned 67 miles of track; total track mileage of 325 miles; 53 miles of trackage rights on other RRs
- ▶ 127.2 miles of yard & industrial tracks
- ▶ Over 500 industries, 35 public team tracks served on B&OCT tracks
- ▶ Interchange between 34 railroads
- ▶ Normal day handles 2,700 cars
- ▶ 86 or more train crews a day

Source: 1952 Director's Inspection Tour

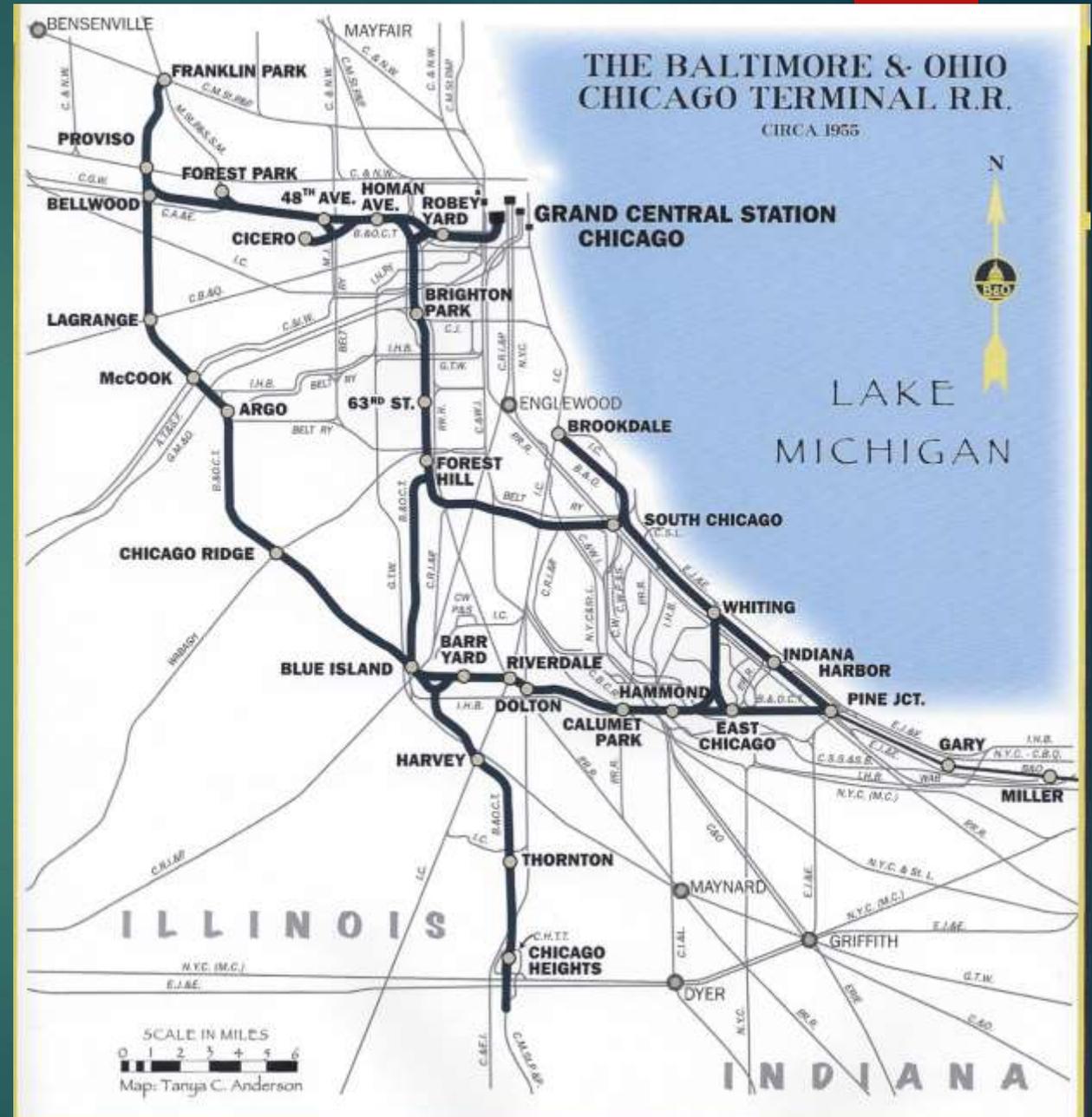


Baltimore & Ohio Railroad, Voyageur Press

# Baltimore & Ohio Chicago Terminal

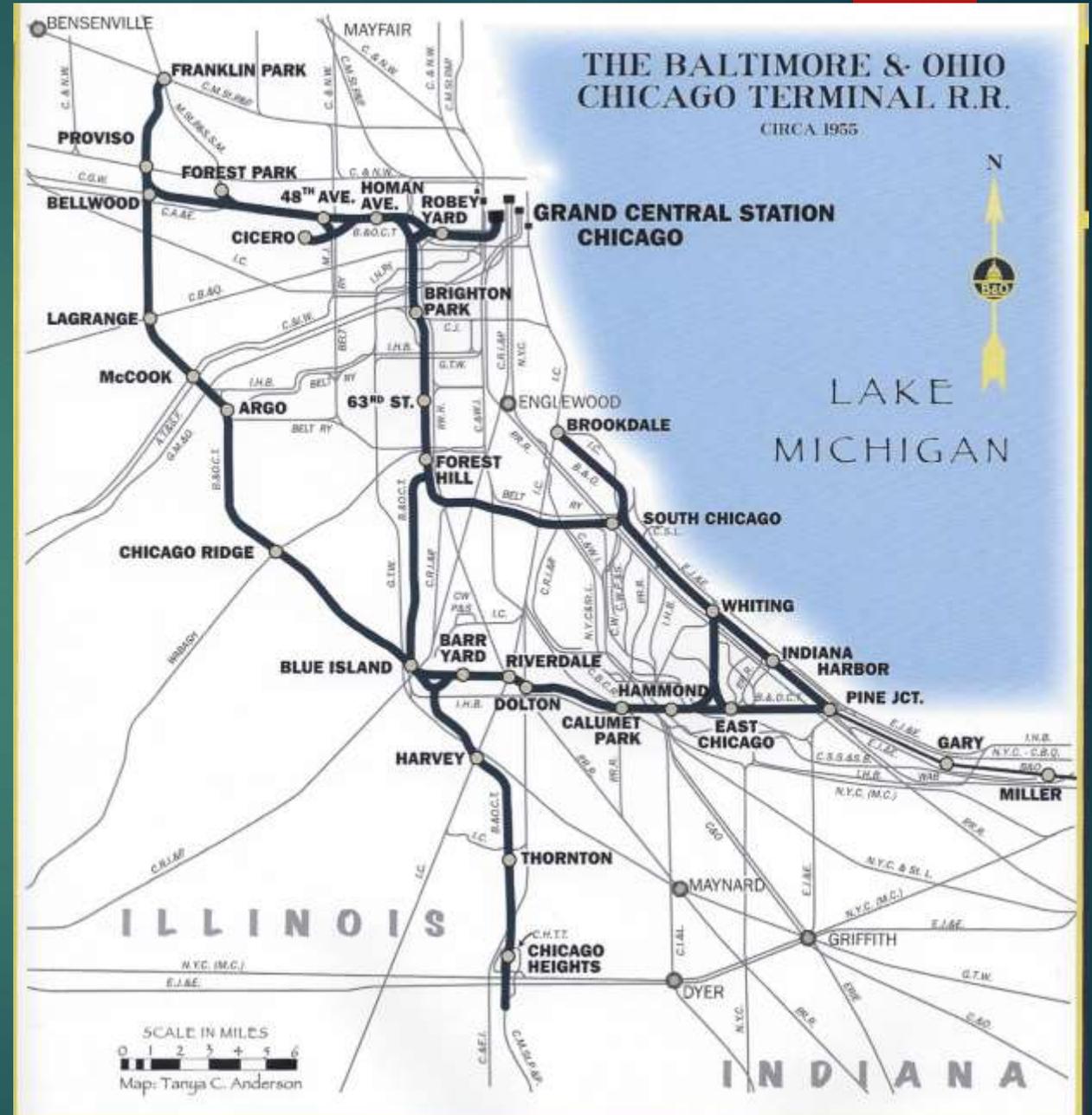
- ▶ **Mainline** – Double track from Grand Central Station to Pine Jct.
- ▶ **Forest Park (Altenheim) Branch** – From Western Ave. Jct. to Forest Park (rights over CGW)
- ▶ **Southwestern Spur** – From 46<sup>th</sup> Ave. to Cicero
- ▶ **McCook Branch** – From Blue Island to McCook (rights over Indiana Harbor Belt to Franklin Park)
- ▶ **Chicago Heights Branch** – From Blue Island to Chicago Heights
- ▶ **Whiting Spur** – From East Chicago, IN to Whiting, IN

Source: 1952 Director's Inspection Tour



# B&OCT Yards

- ▶ **Barr Yard** – Major B&O classification yard in Chicago with classification capacity of 2,353 cars, plus 845 cars in receiving yards
- ▶ **Robey St. Yard** – Main downtown yard serving industries and interchange, originates mainline trains. Capacity of 575 cars. (Lincoln St. Coach Yard holds 232 passenger cars.)
- ▶ **16<sup>th</sup> St. Yard** – Adjacent to Grand Central, serves downtown freight terminals
- ▶ **Homan Ave. Yard, 48<sup>th</sup> Ave. Yard** – Serve industries, interchange on branch
- ▶ **Forest Hill at 75<sup>th</sup> St.** – Serves Forest Hill Transfer Facility
- ▶ **54<sup>th</sup> Ave. on Southwest Spur** – Serves Cicero Industrial District
- ▶ **East Chicago, Whiting, Parrish Ave** – Serves Calumet Industrial District



Source: 1952 Director's Inspection Tour

# Grand Central Station

- ▶ Acquired by the B&O at foreclosure in 1910 and operated by the Baltimore and Ohio Chicago Terminal Railroad
- ▶ Designed by architect Solon Spencer Beman for the Wisconsin Central Railroad and completed by the Chicago and Northern Pacific Railroad
- ▶ Opened on Dec, 8, 1890; Torn down in 1971
- ▶ Designed in the Norman Castellated architectural style and constructed of brick, brownstone and granite.
- ▶ 228 feet wide on the side facing Harrison St.; 482 feet long on the side facing Wells St.
- ▶ 247-foot tower with a four-sided clock, 13 feet in diameter.



# Grand Central Station

- ▶ Train shed was a self-supporting glass and steel structure
- ▶ One of largest in the world at time of its construction
- ▶ 555 feet long, 156 feet wide and 78 feet tall
- ▶ Covered six tracks and had platforms long enough to handle 15-car, turn-of-the-century length passenger trains
- ▶ Closed on Nov. 8, 1969, with the few remaining trains transferred to North Western Station





C.L. Smith

Grand Central Station is home to passenger trains from Baltimore & Ohio, Soo Line, Chicago Great Western and Pere Marquette (acquired by the C&O in 1947)





- ▶ Own 6 steam locomotives, 17 switching diesel locomotives
- ▶ Lease 8 steam locomotives, 16 diesels from B&O
- ▶ No grade crossings for 10.5 miles from Grand Central on the main line and 8 miles from Grand Central via the Forest Park Branch
- ▶ Have own cabooses and MOW equipment

Source: 1952 Director's Inspection Tour

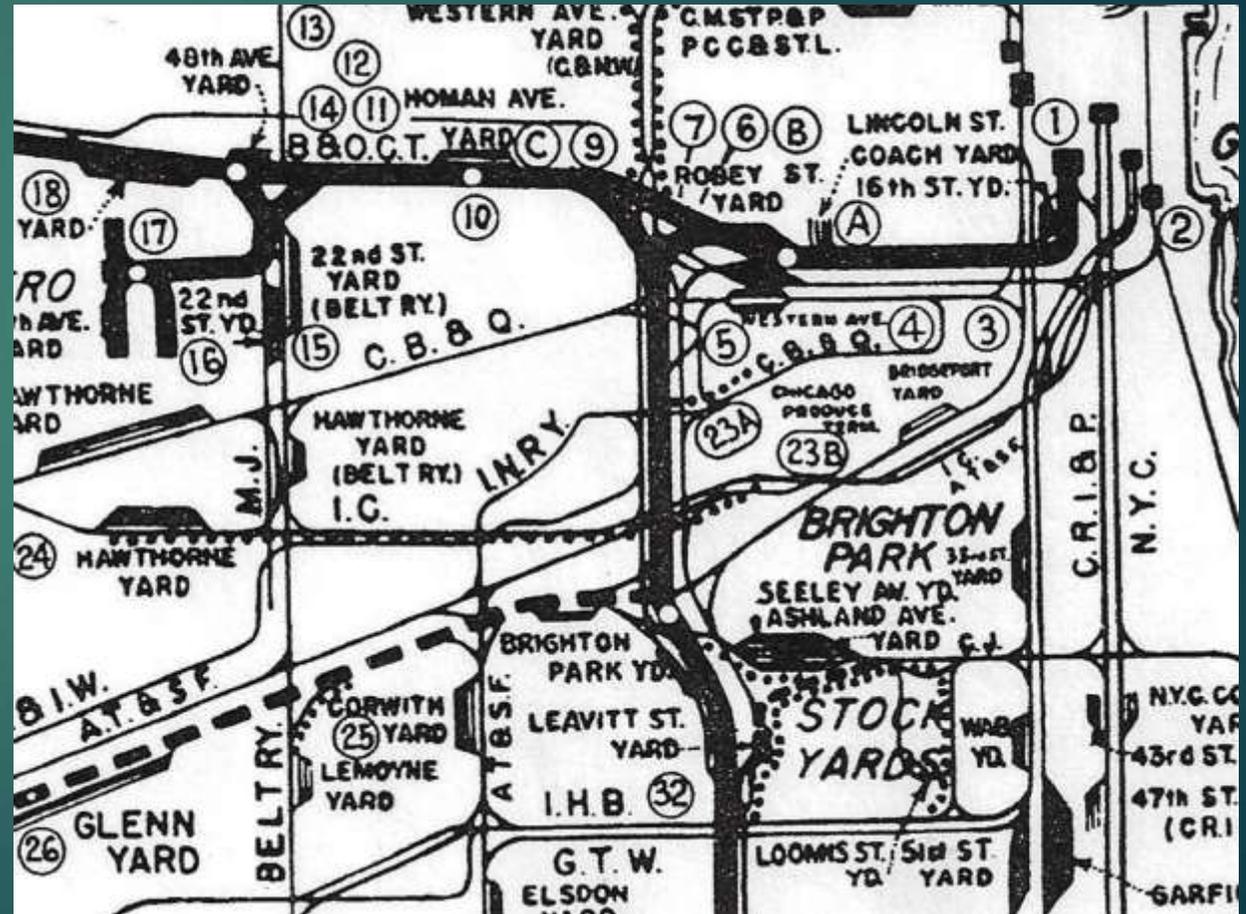


Mark Vogel  
Collection

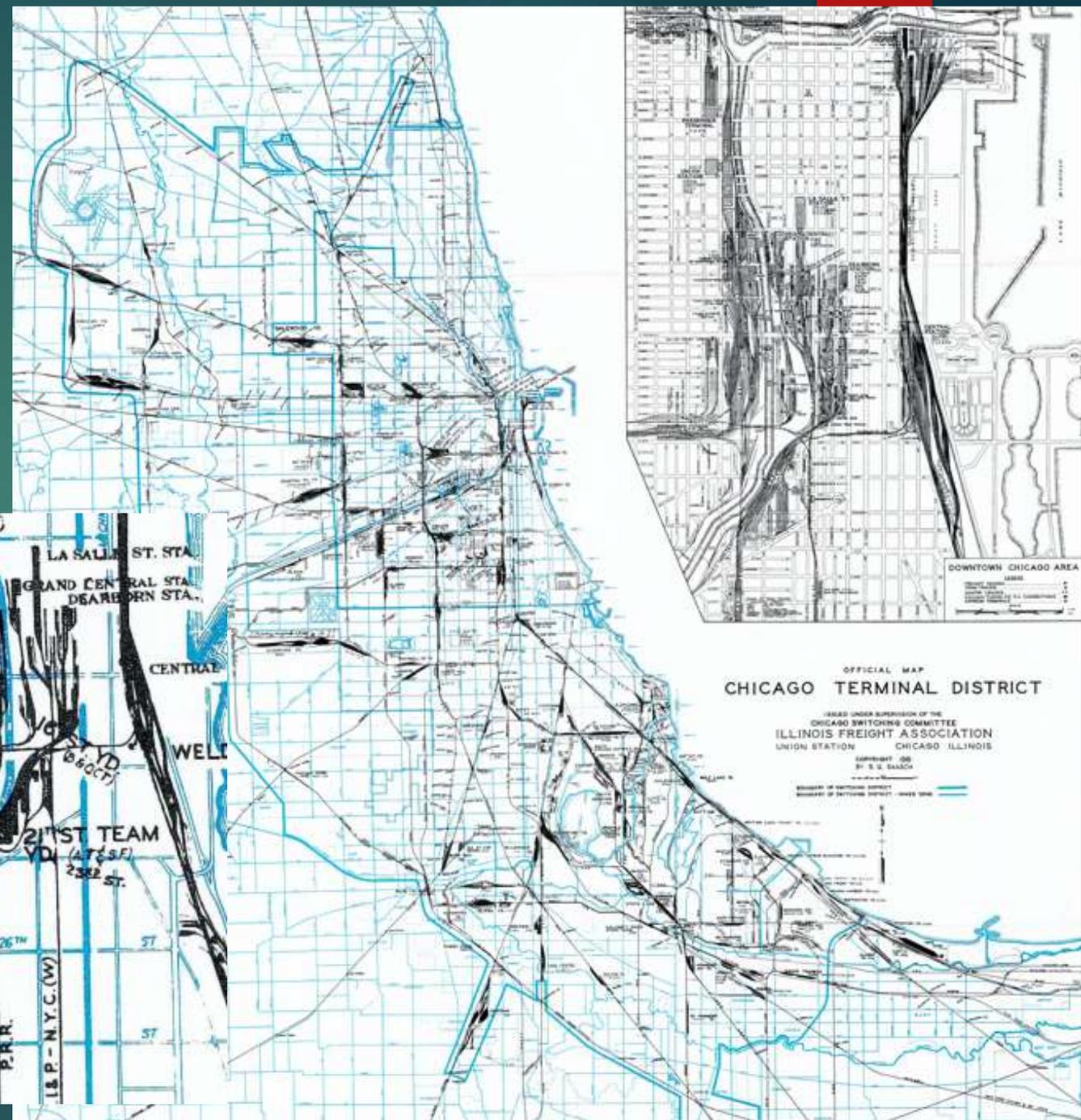
# Starting to Look Good to Me

## Area Around Western Ave. Wye

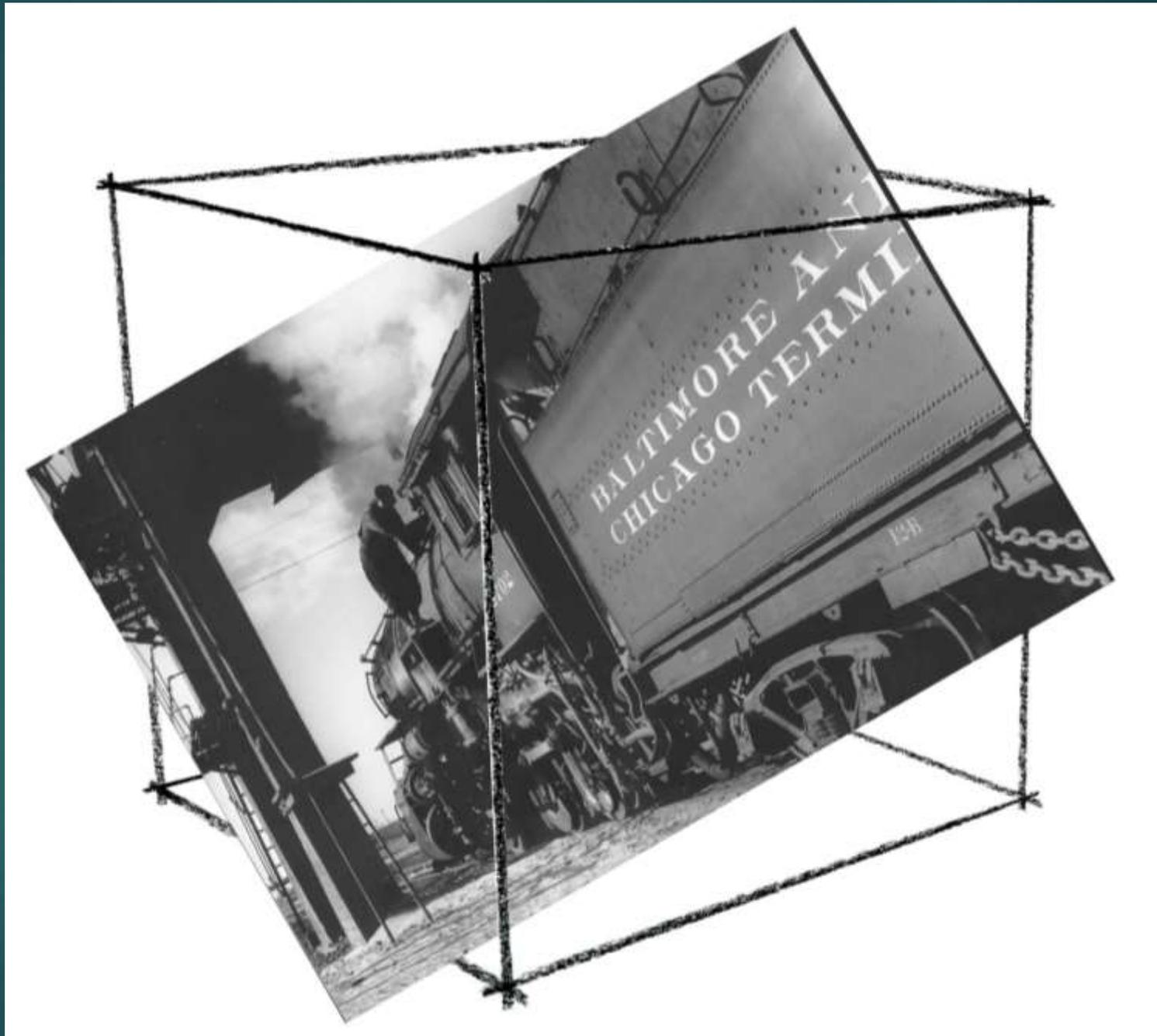
- ▶ Grand Central Station – Let's me keep my brass passenger trains
- ▶ Robey Yard – Gives me a “not too big” classification yard
- ▶ Altenheim Branch gives me industrial switching, including Sears
- ▶ Major freight house operations
- ▶ Not often modeled mail & express
- ▶ Terminal and interchange operations are different
- ▶ Very active wye is key to operations
- ▶ B&OCT isn't being modeled elsewhere



# We're Only Going To Model About 6 Miles



We're  
Going  
To Need  
A Bigger  
Box





# 280 SF Gained, But We Need More



## Calling to Me:

- Unexcavated Crawl Space
- Block Structure Between the Rooms

# May 18, 2014: Walls Come Tumbling Down



Knocking down 29-foot long concrete block wall

# Gaining Space

Don't be afraid to create more



Removing bone dry red clay



# Gaining Space

Don't be afraid to create more

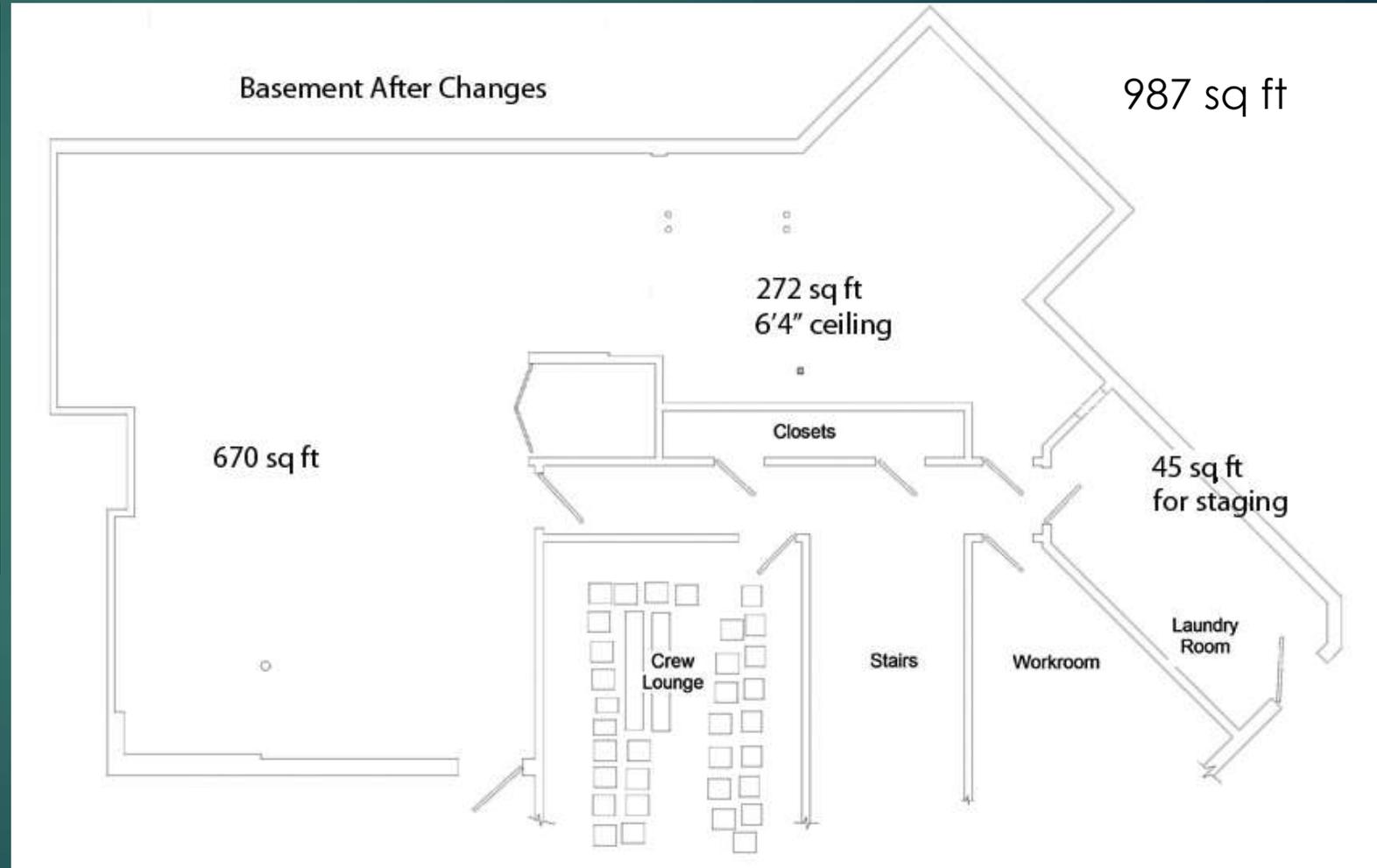
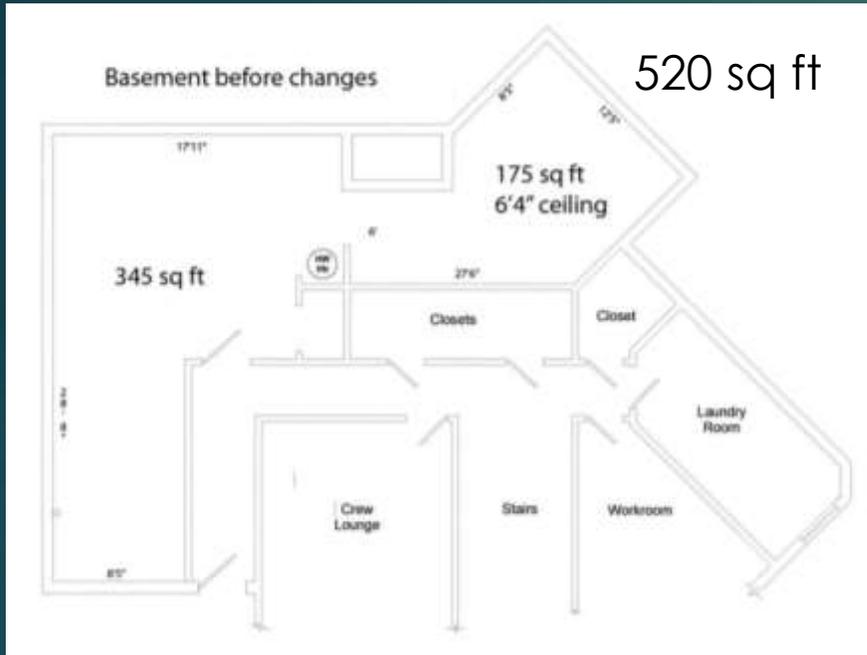


Three-foot wide opening is now 10 feet



June 1, 2014

# Gaining Space: Increase of 467 Sq Ft (47%)\*



## FINAL STEPS

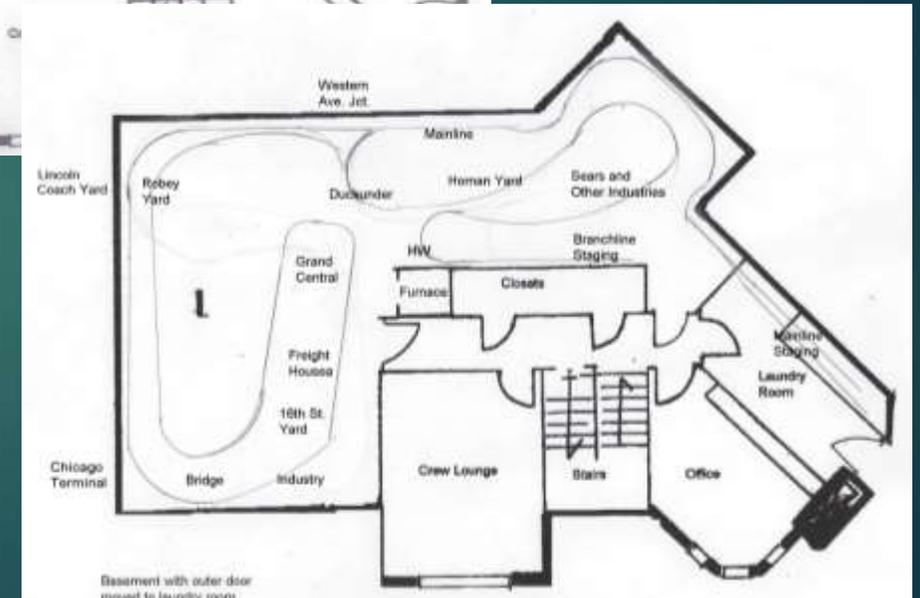
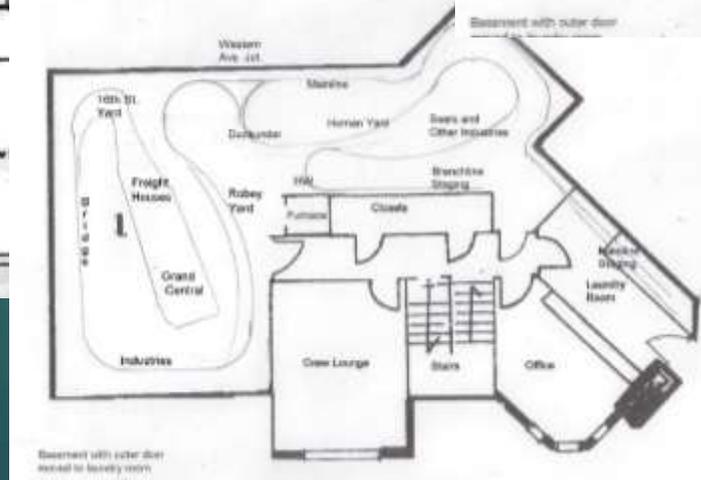
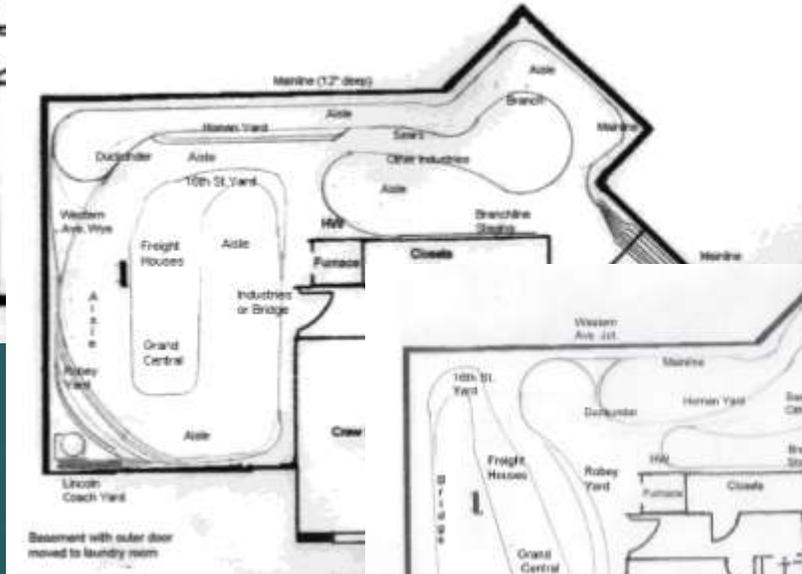
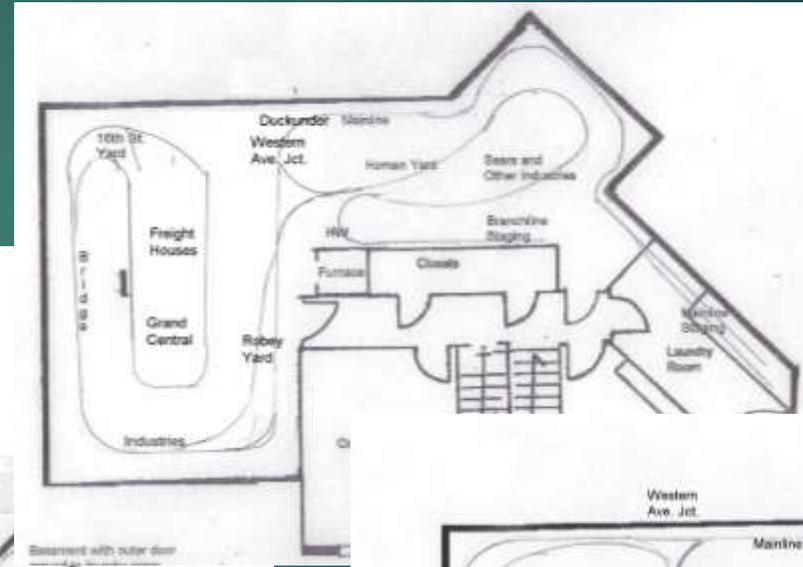
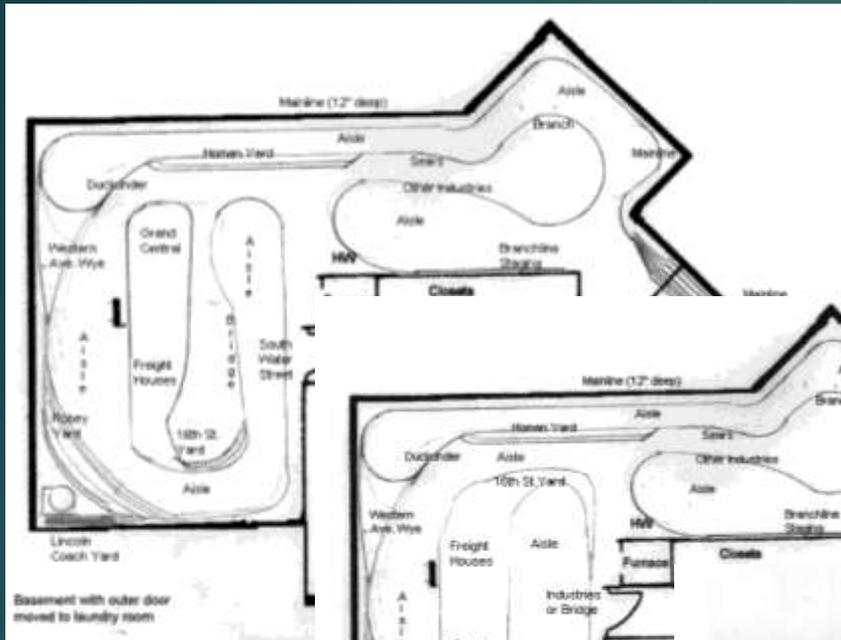
- Dug out 233 sq ft of crawl space, with deepest spot almost 10 feet
- Removed obstruction, 48 sq ft
- Cut 16 inches from back of closets, 19 sq ft
- "Air rights" in laundry, 45 sq ft

\*Plus 200 square feet of storage, work shop moved out of basement

# Bonus: Created Nice Entrance to Layout

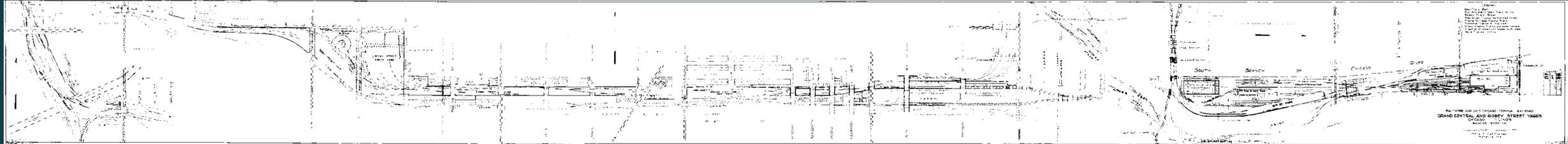


# The Design Process: Enter Bill Raymond



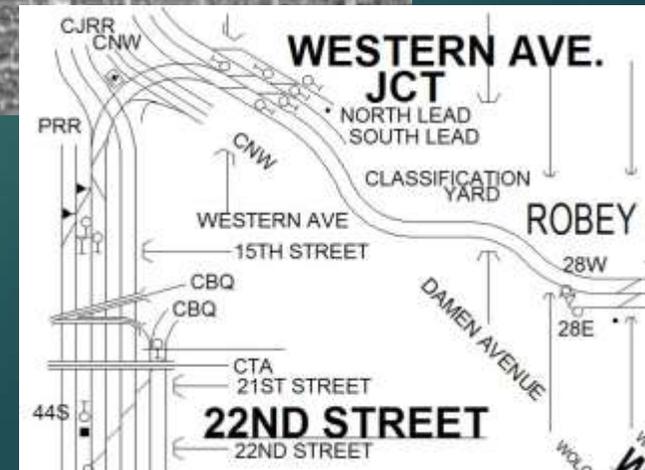
My crude drawings

# First Meeting: Late February, 2014



## 2-1/2 Inch Binder

- ▶ Layout Plans
- ▶ B&OCT Background
- ▶ Givens & Druthers
- ▶ Key Elements
- ▶ Terminal Overview
- ▶ 1952 Director's Inspection
- ▶ Valuation Maps
- ▶ Industry Details
- ▶ Sanborn Maps
- ▶ Aerial Photos



# Signature Scenes

- Grand Central Station
- South Water St. Market
- Western Ave. Wye
- Bascule Bridges
- Robey Yard
- Sears Roebuck



John W. Barriger



John Dziobko, Jr



Chicago History Museum



Library of Congress



Illinois Clearing House for Historical Aerial Photos



Unknown

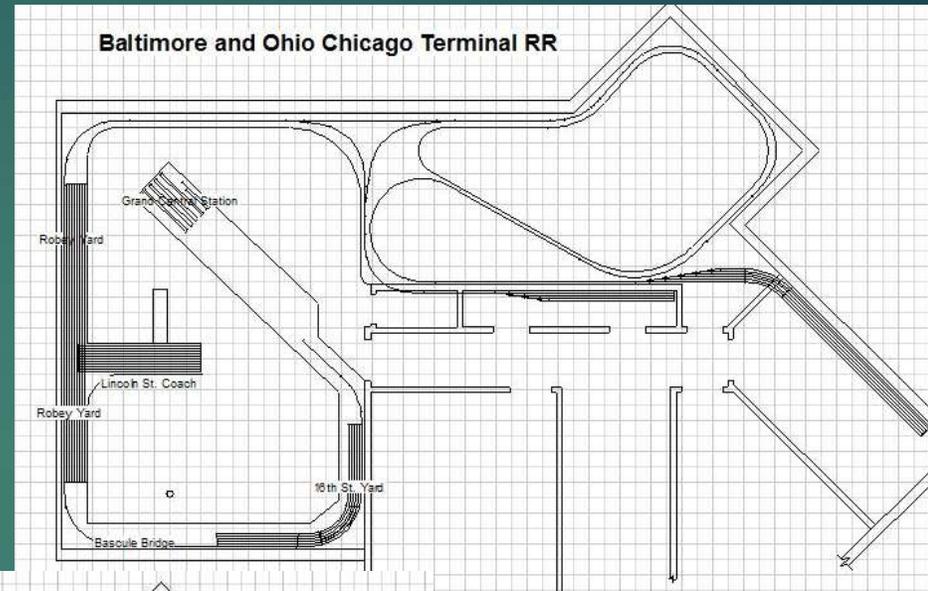
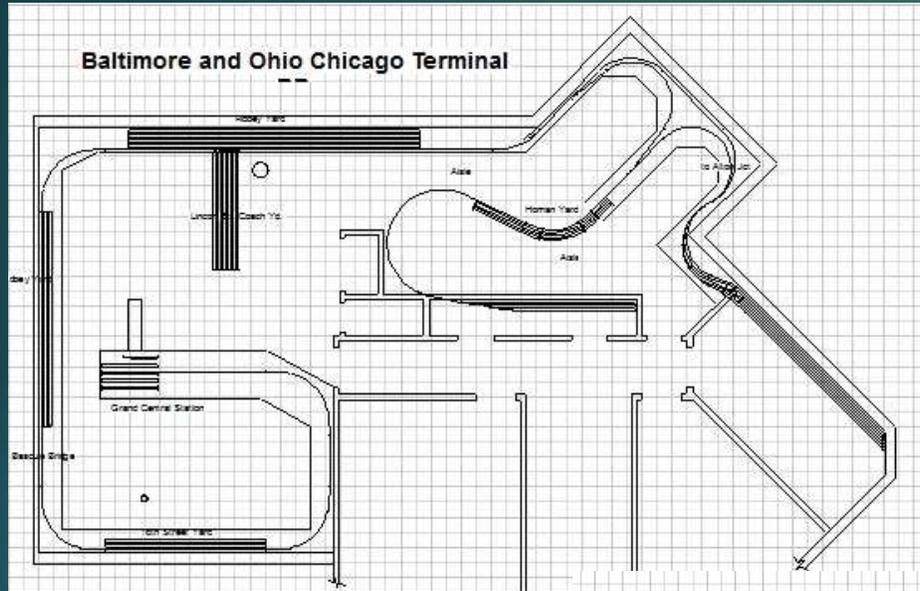
# Key Givens & Druthers

- ▶ Main operation priority is switching
- ▶ Single level; Height 50-52 inches
- ▶ No (or very limited) hidden trackage
- ▶ No helix
- ▶ No duckunders
- ▶ No hidden staging; Active, open staging in laundry room
- ▶ Three-foot aisles (less OK at end of branch)
- ▶ 80-foot passenger trains and 0-8-0 switchers are the limiting equipment
- ▶ Minimum 36-inch curves; 40-inch curves where passenger trains are backed
- ▶ Minimum No. 5 turnouts in yards, No. 6 (and prefer No. 8 or higher) on Mainline



Robert Leffingwell FLICKR.com

# Version 1.0: Placing Elements



March 14, 2014

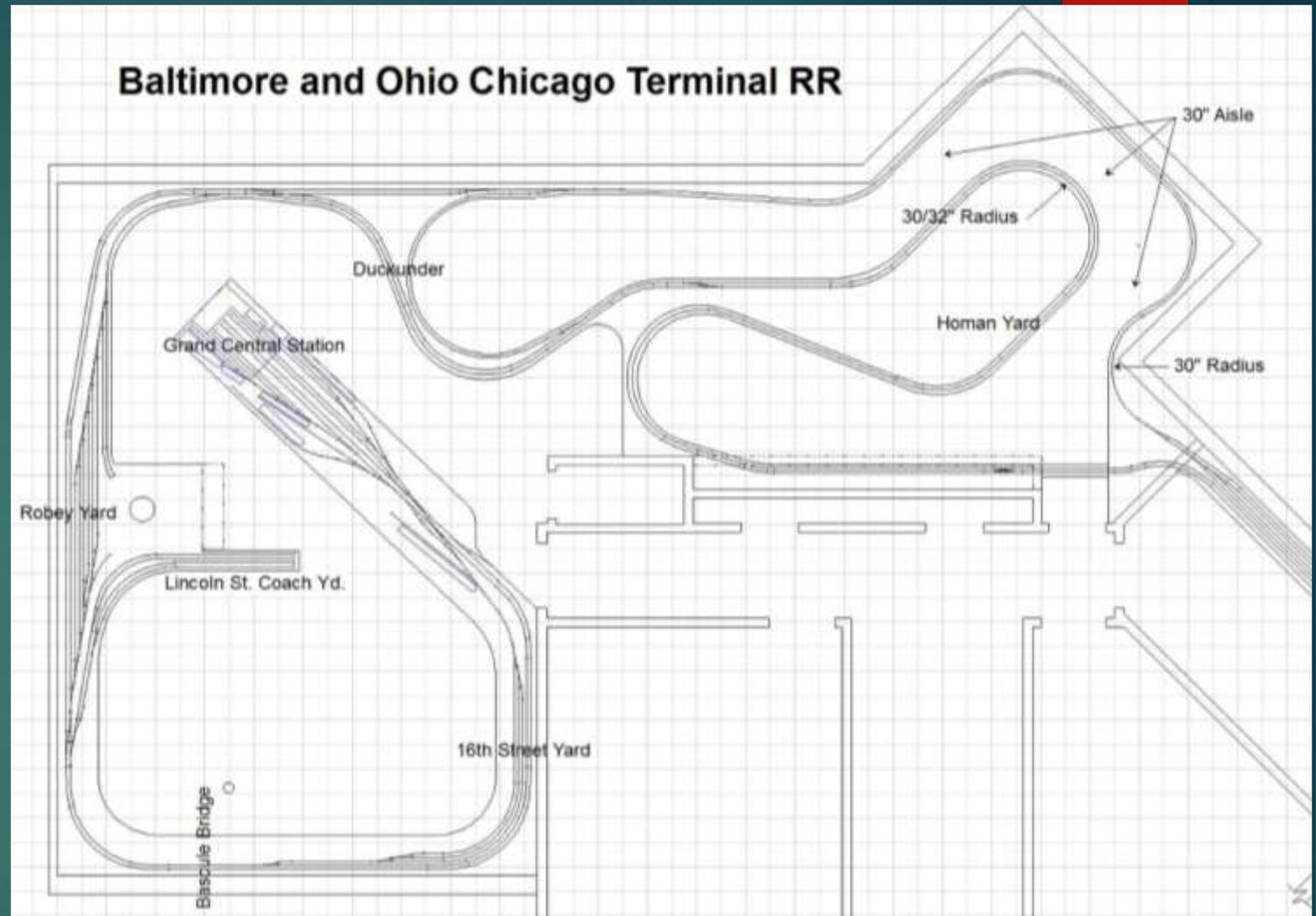
## Major Elements

- Western Ave. Wye
- Robey Yard
- Lincoln Coach Yard
- Grand Central
- Bascule Bridges
- Homan Yard



# Version 3.0

- Keep mainline on outside wall. Reduce benchwork to minimum to gain aisle space
- Eliminate branchline staging in closet. Add drop bridge, connect w/LR staging. No need to duckunder to get to branch
- Move closet wall back 16"
- Keep branchline turn-back loop tight
- Like to capture the feel of Robey Yard being on a curve
- Will need to get in S. Water St. Market sidings, Soo Line

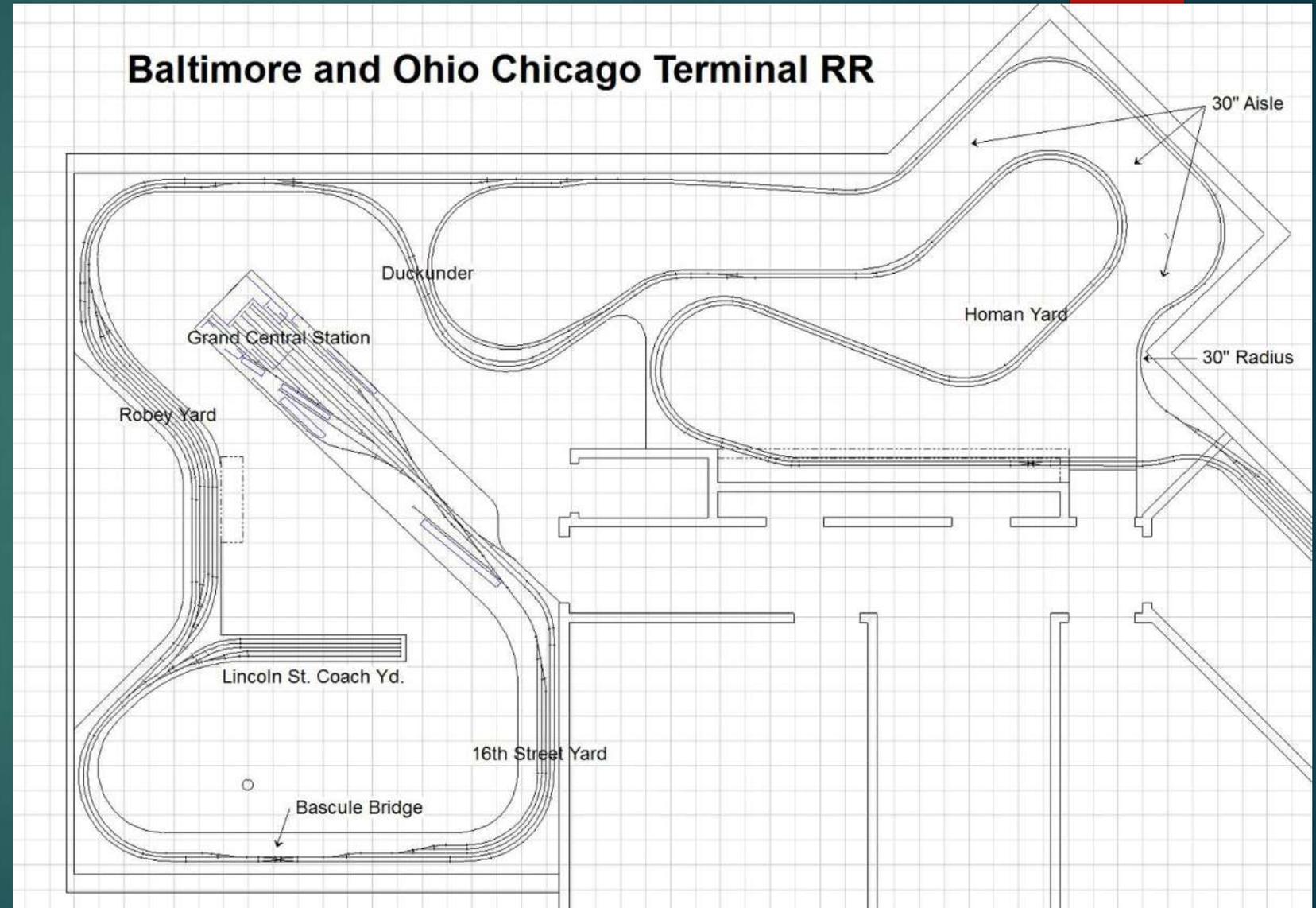


- Could not get Robey Yard on a curve
- Roundhouse/turntable, etc. blocking access to the yard
- Beginning to look like we are going to have to give up some key features to make it all work

# Version 3.1

## More food for thought

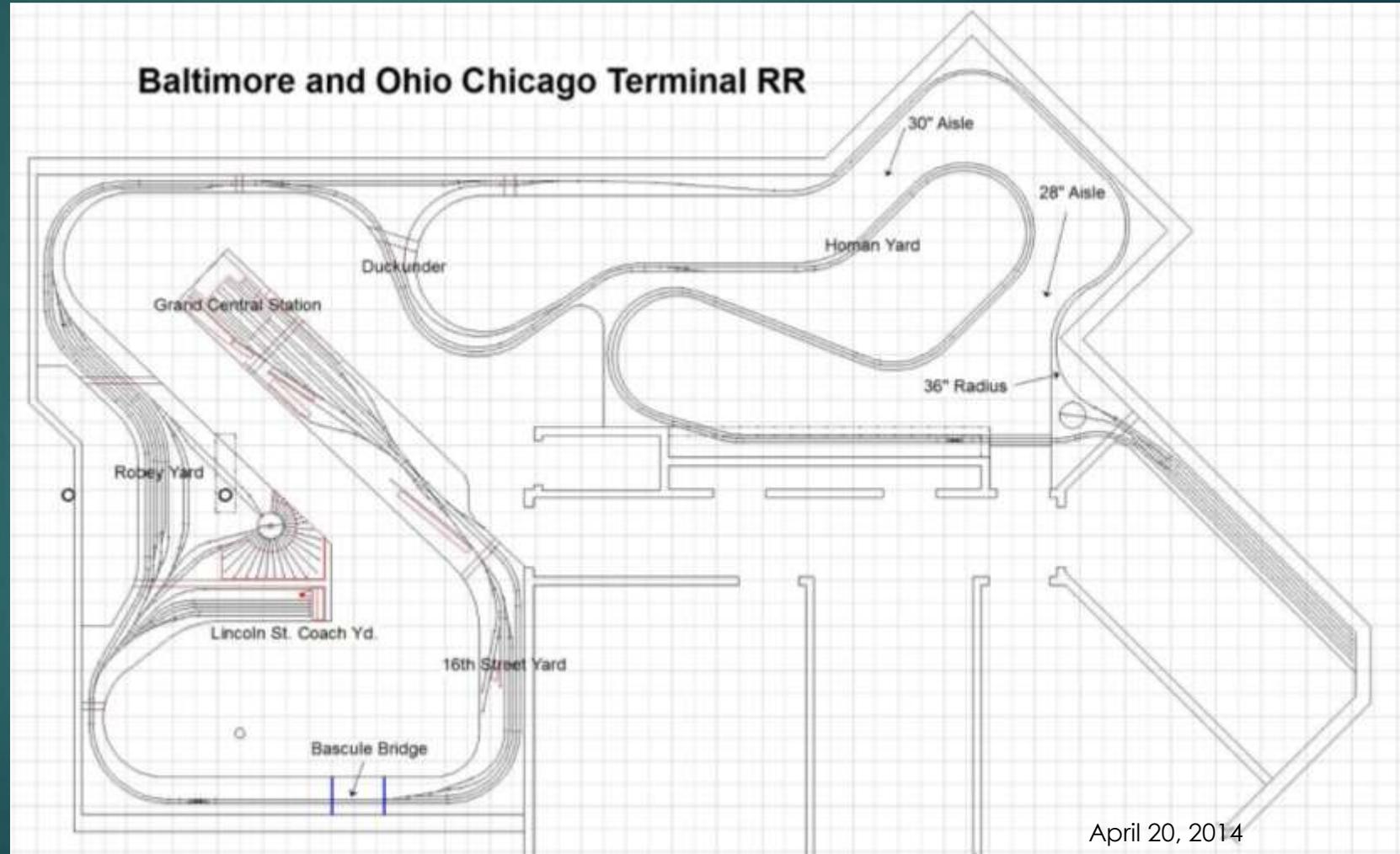
- Robey Yard on a curve. Still can't figure out way to add engine terminal without blocking access to something else.
- Creates a "pit" for Robey Yard YM
- Could still squeeze in the Bascule Bridge.
- Is there a way to replace column in existing wall? Would give better access to Robey Yard; May open up a solution for engine terminal



# Version 4.0: What happens if we move part of the west wall back two feet?

From this point on, everything will be refining this plan

Time to pause and wait for final construction



# Construction Brings Good News

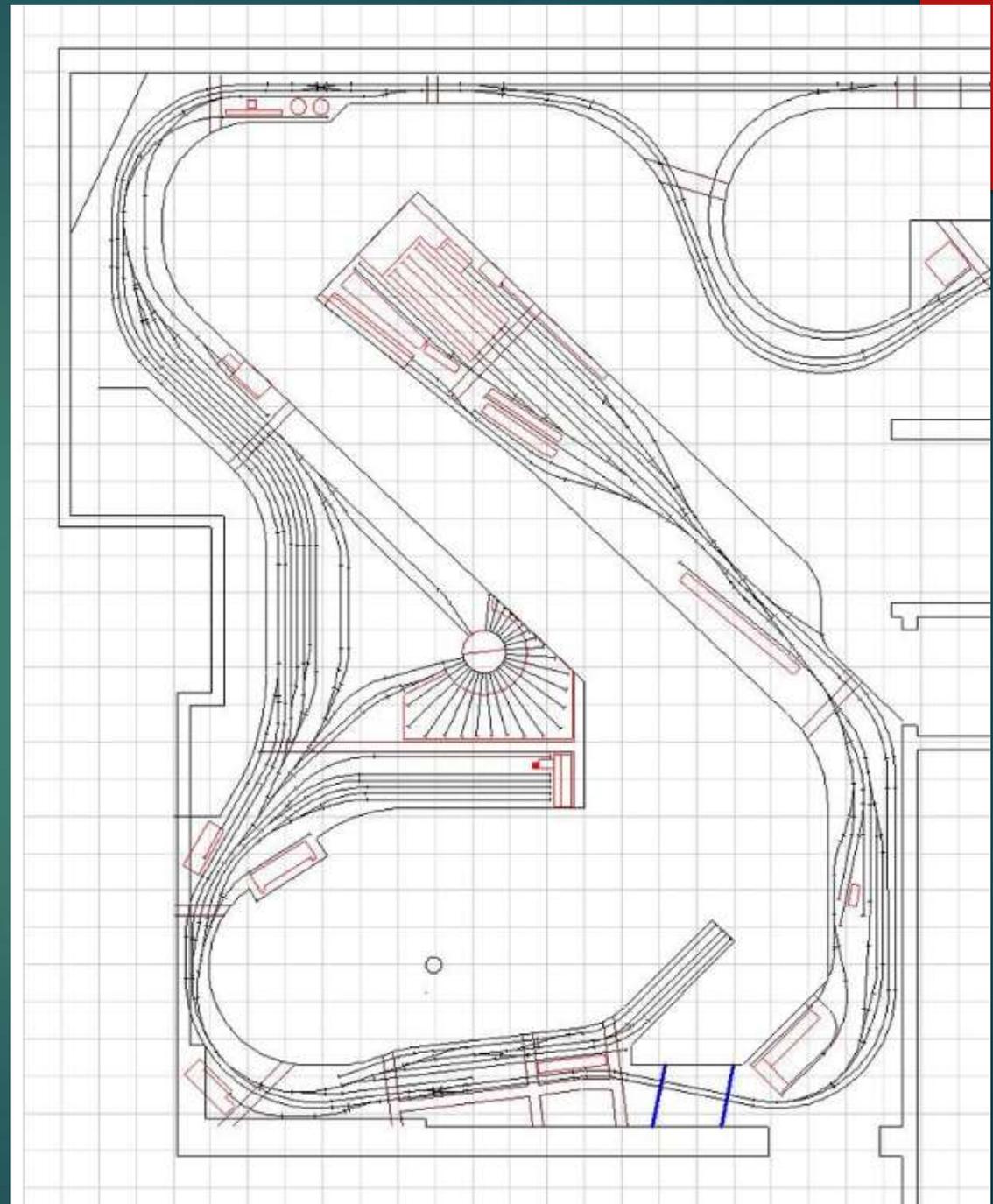


- ▶ Reinforcing center beam eliminated support
- ▶ We can extend the layout over the top of the footers, gaining depth

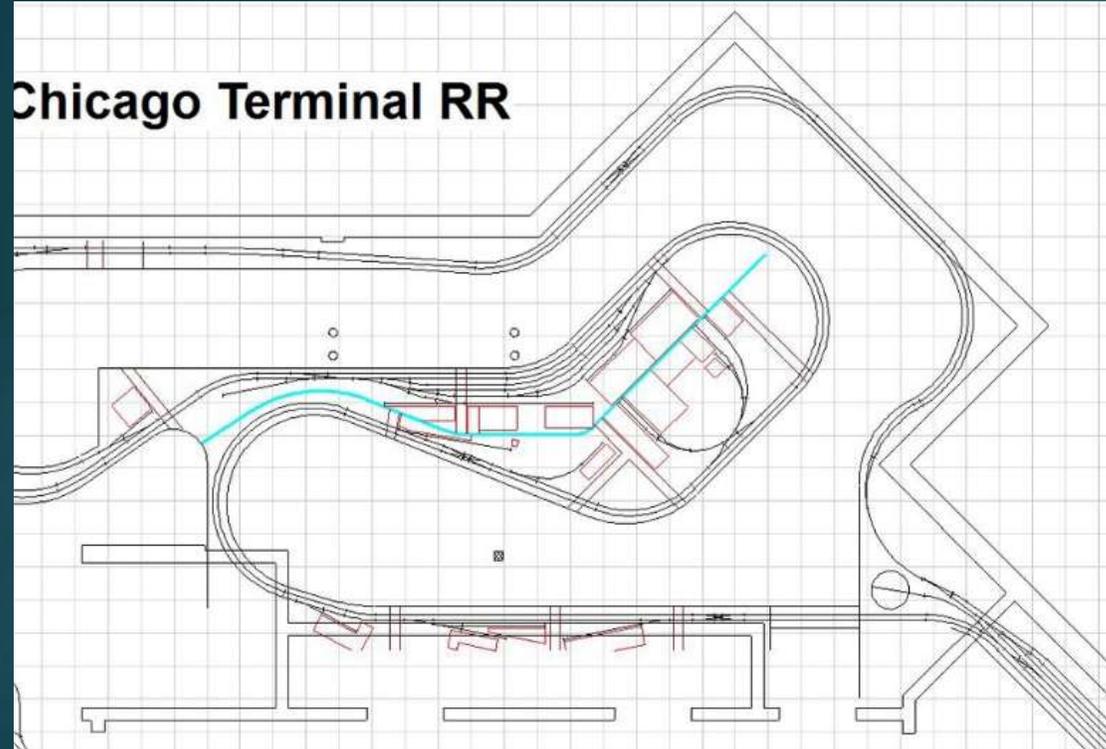
# Construction Brings Good News



- ▶ Unobstructed space for yard and engine facility
- ▶ Additional four feet lets us create prototypical curve in Robey Yard



# Branchline decision



Space Around Yard is Too Tight  
Prototype Fidelity vs. Operating Space



# Ready to Start on Benchwork

## Baltimore and Ohio Chicago Terminal RR

Henry Freeman, General Superintendent

Bill Raymond, Chief Engineer

Plan Date: 8/17/2014



Plotting a benchwork grid let me anticipate framing for switches, etc.

# Building Benchwork

Benchwork for Robey Freight Yard and Lincoln Coach Yard



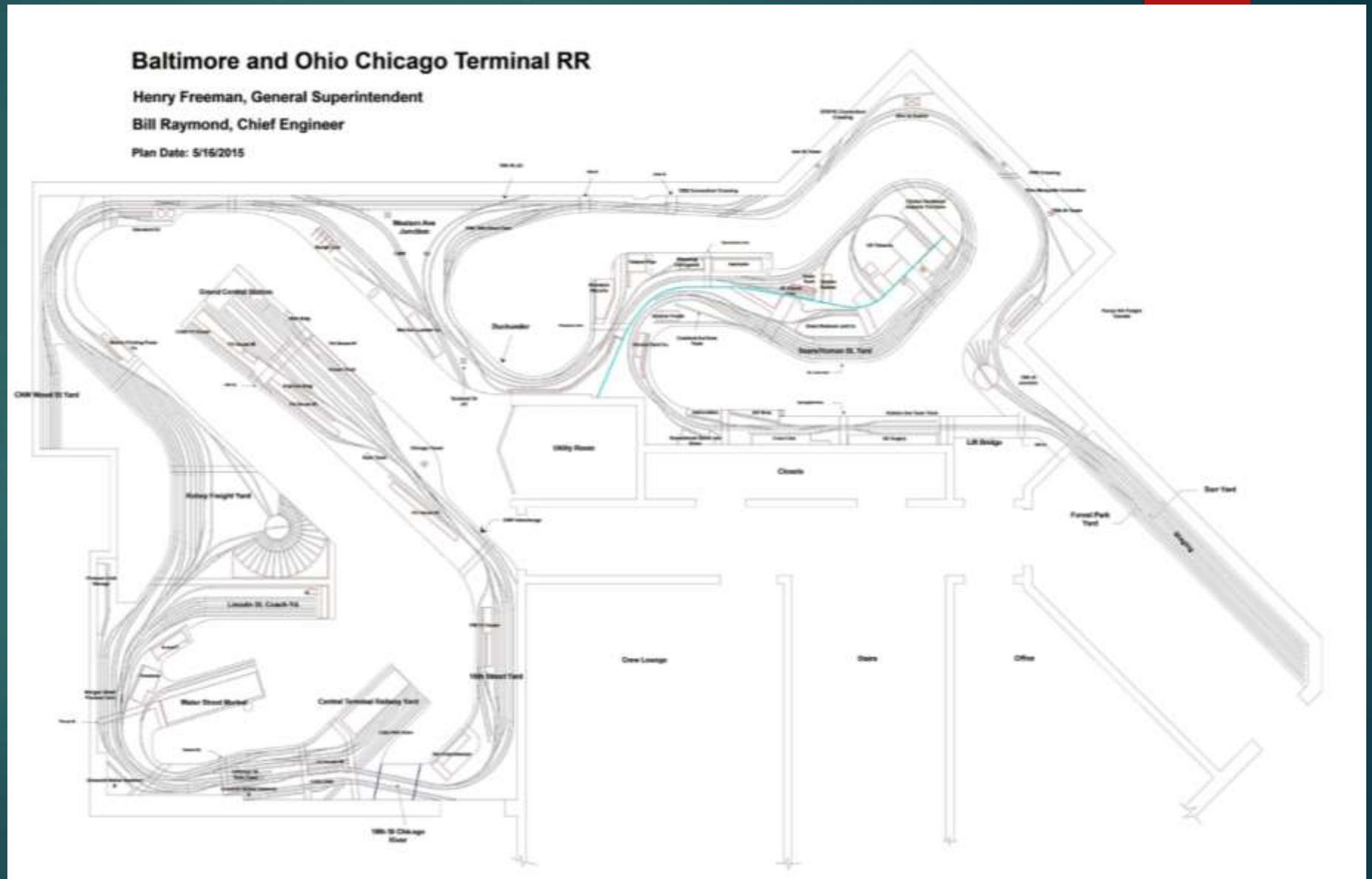
# Issue: Three Possible Duckunders



- ▶ To enter the part of the layout that contains lines to/from staging to mainline and Altenheim branch. Solution: Swing gate
- ▶ To enter working space occupied by Robey YM. Only affects one or two operators who will be there for the rest of session. Impact: Minimal.
- ▶ To get across wye to follow mainline trains or trains going down branch. One solution: Crew could stop train, exit room through one door and re-enter other door. This "no duck-under" option will be important as my crew ages. Most will want to follow train.

# Version 5.0: The Final Plan (Is it ever?)

- ▶ Grand Central Station
- ▶ 9 Switching Districts
- ▶ 4 Yards
- ▶ 31 Industries
- ▶ 11 Freight Houses
- ▶ 5 Team Tracks
- ▶ 10 Interchange Points with 12 Railroads
- ▶ Chicago River Bascule Bridges



# One Year Later: Main Room



Carpet is previously used, commercial grade,  
padded carpet tiles



# One Year Later: Branchline



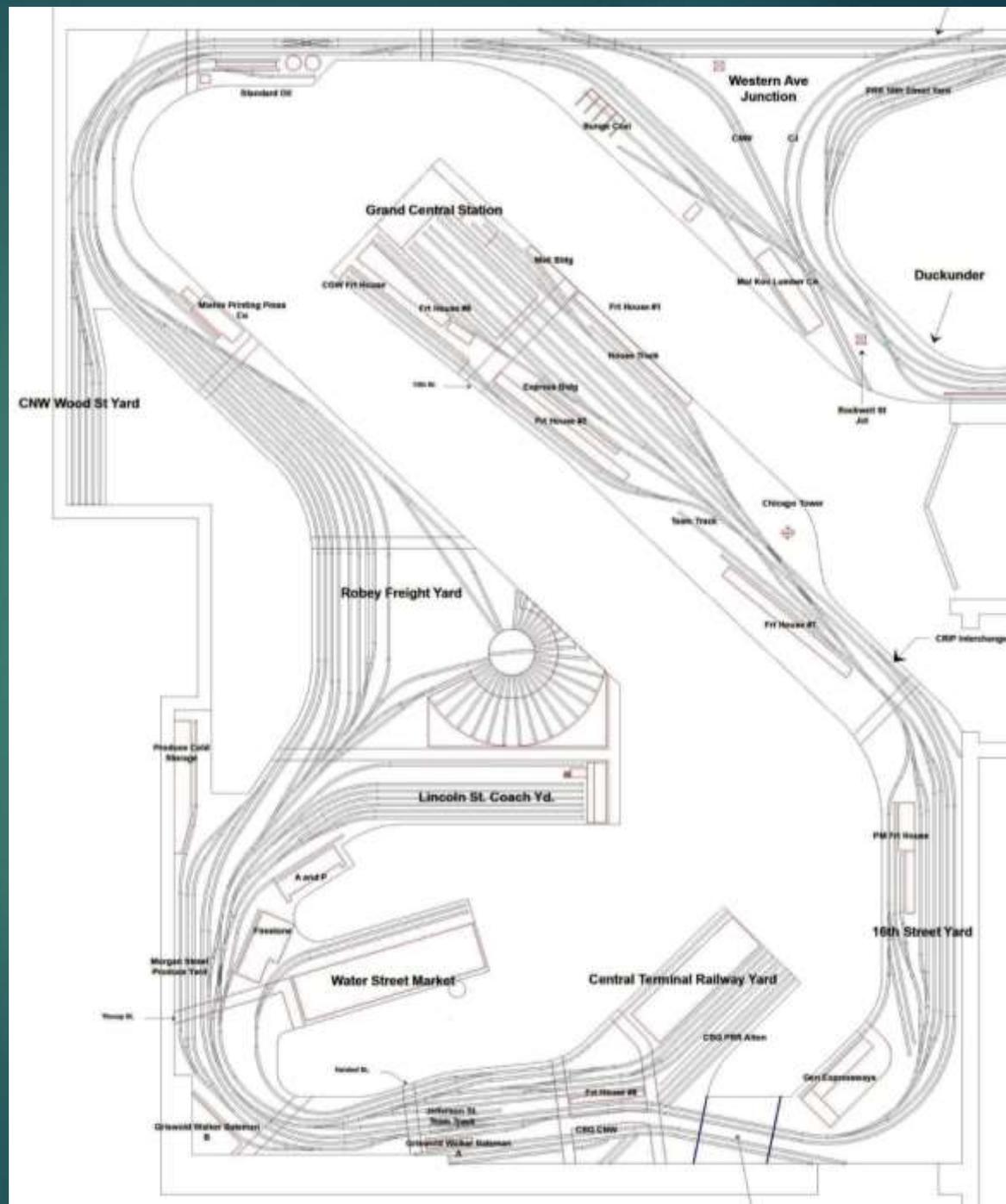
# 18 Months later: Branchline



# Final Plan

Pretty much included everything on my wish list

- ▶ What I wanted but didn't get:
  - ▶ No duckunders
  - ▶ Layout height 50-52 inches
    - ▶ Got 47-1/2 inches
  - ▶ 36-inch aisles
    - ▶ Got some at 28 inches
    - ▶ One very short space at 21 inches (with human passing siding)
  - ▶ Longest station track at 15 feet
    - ▶ 15-feet if crossover is blocked
  - ▶ 36-Inch Minimum curves
    - ▶ Got 40-42 inch on mainline
    - ▶ Got 30-inch on branchline



Stage Two  
of Construction

# 11 Switching Districts

Name	Industries	Spots
12 <sup>th</sup> St.	7	45
16 <sup>th</sup> St.	5	34
Jefferson St.	5	17
Morgan St.	5	31
East Line	5	27
Aermotor	7	27
Homan East	7	24
Homan West	6	22
48 <sup>th</sup> Ave.	8	31
Forest Hill	3	18
PRR 16 <sup>th</sup> St.	3	6
TOTAL	61	282



B&OCT Transfer Run

Bill Raia

## 10 Interchange Points

- 1. Robey St. Yard.** From: ATSF, CB&Q, CNW, GM&O, IC, PM
- 2. Homan Ave. Yard.** From: CNW, Manufacturer's Jct. Both: PRR, Soo Line
- 3. Wood. St. Terminal.** To: CNW
- 4. Western Ave. & 16<sup>th</sup> St.** To: CB&Q
- 5. Ash St.** To: ATSF, IC. Both: Chicago Produce Terminal
- 6. 76<sup>th</sup> & Oakley Ave.** To: PM
- 7. 48<sup>th</sup> Ave. Yard.** To: CGW, Manufacturer's Jct., CNW
- 8. Barr Yard.** Both: GT, IHB, Milw., Monon, NYC, NKP, CRIP, Wabash. From: C&O
- 9. 12<sup>th</sup> St.** From: PM, CRIP
- 10. Halsted St.** Both: Soo Line



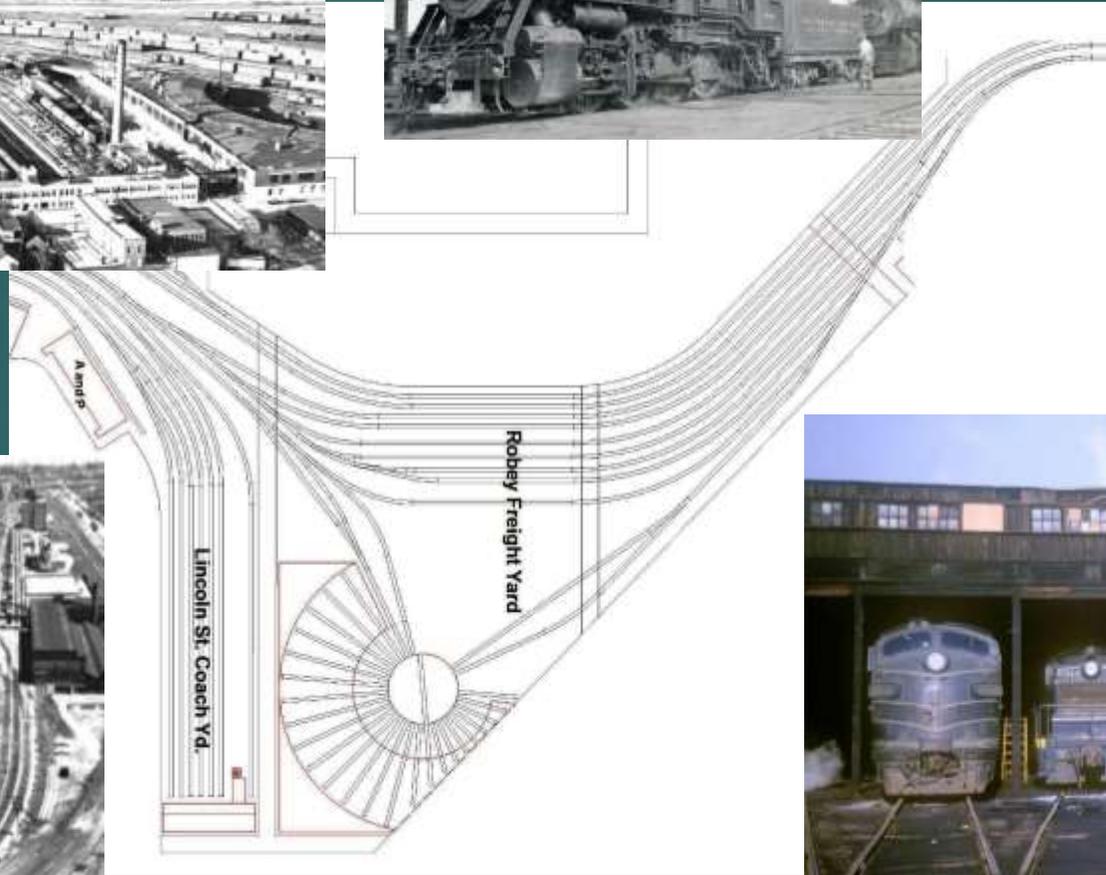
# Robey St. & Lincoln St. Coach Yards



- Robey St. Freight Yard
  - 7 tracks, 162 40-foot cars
  - North lead, 41 cars
  - South Lead, 35 cars
  - Morgan St. Produce Tracks, 23 cars

33% of prototype capacity

- Lincoln St. Coach Yard
  - 7 tracks, 49 80-foot cars



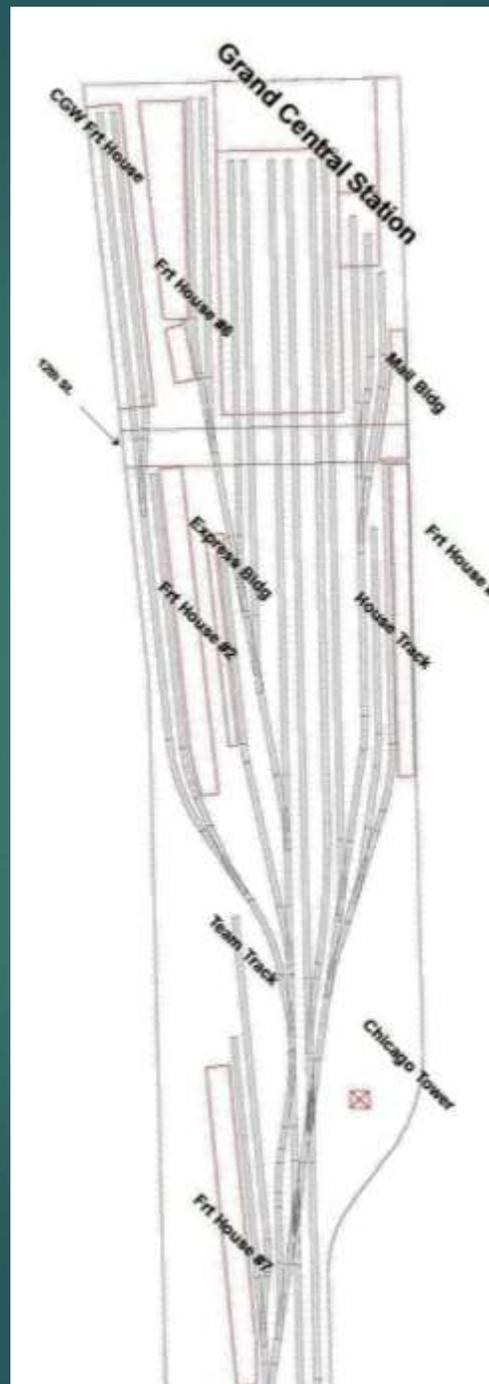
# Grand Central



Phillip A. Weibler

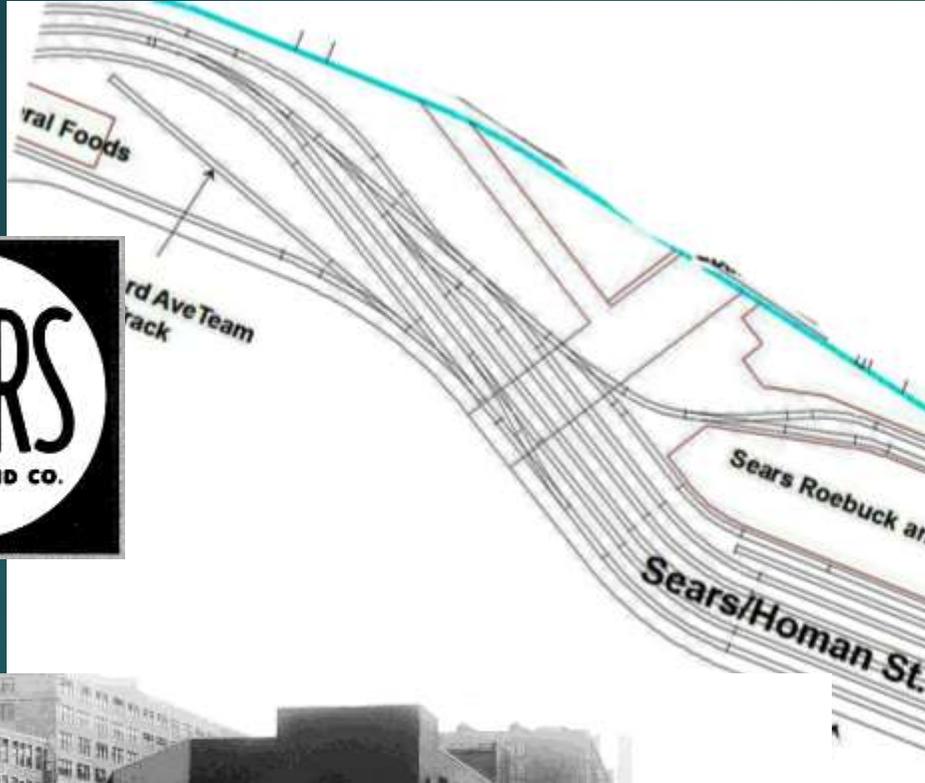
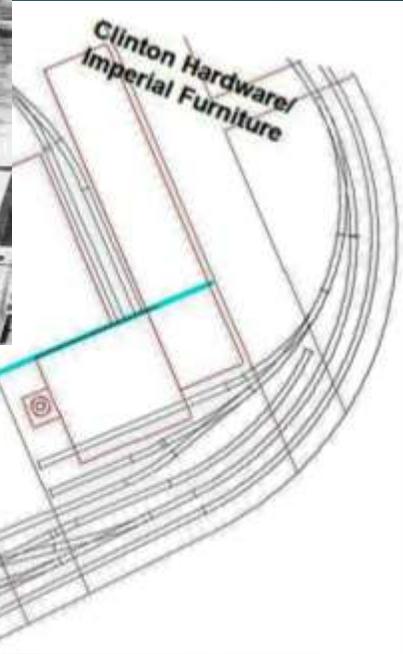
## Grand Central Tracks

- 8 passenger tracks, 53 80-foot cars
- Mail, express, freight capacity for 69 cars



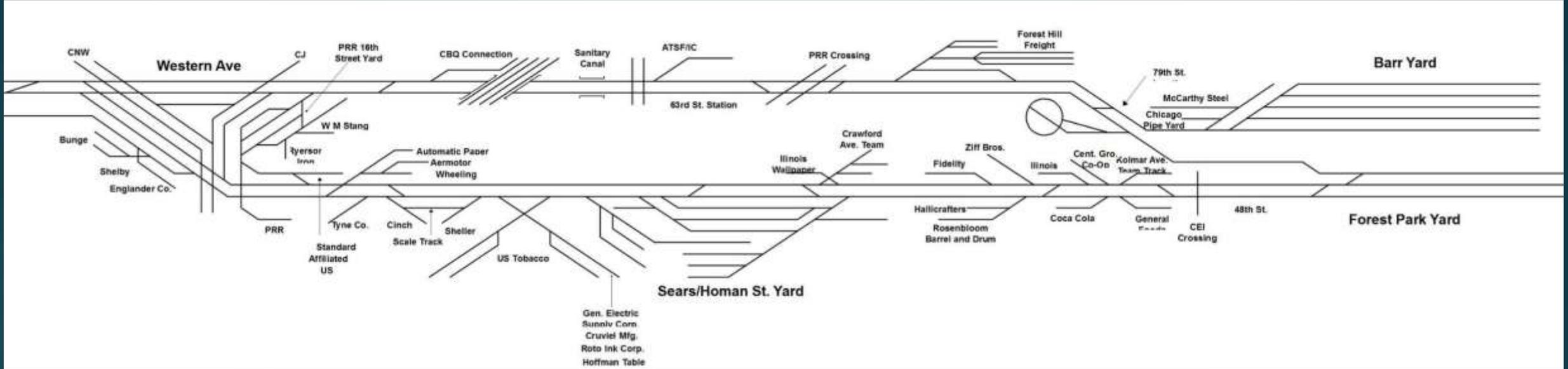
CTA Collection, 1930

# Sears Roebuck Co.

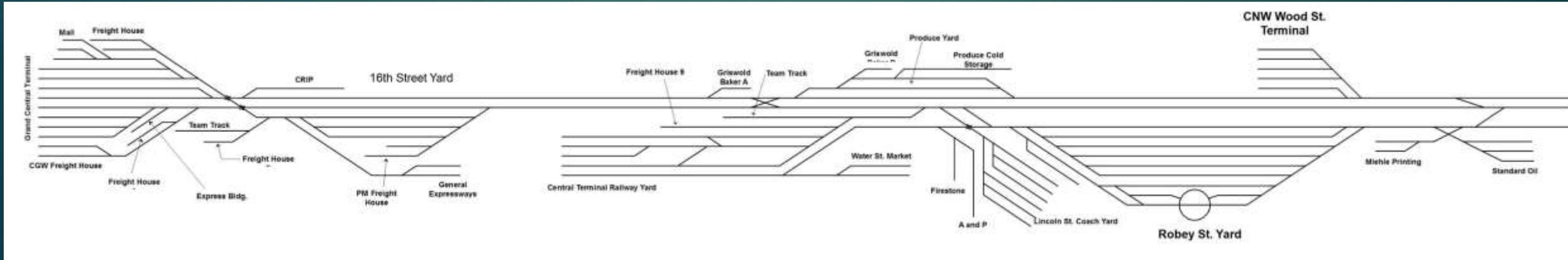


# B&OCT Robey District Schematic

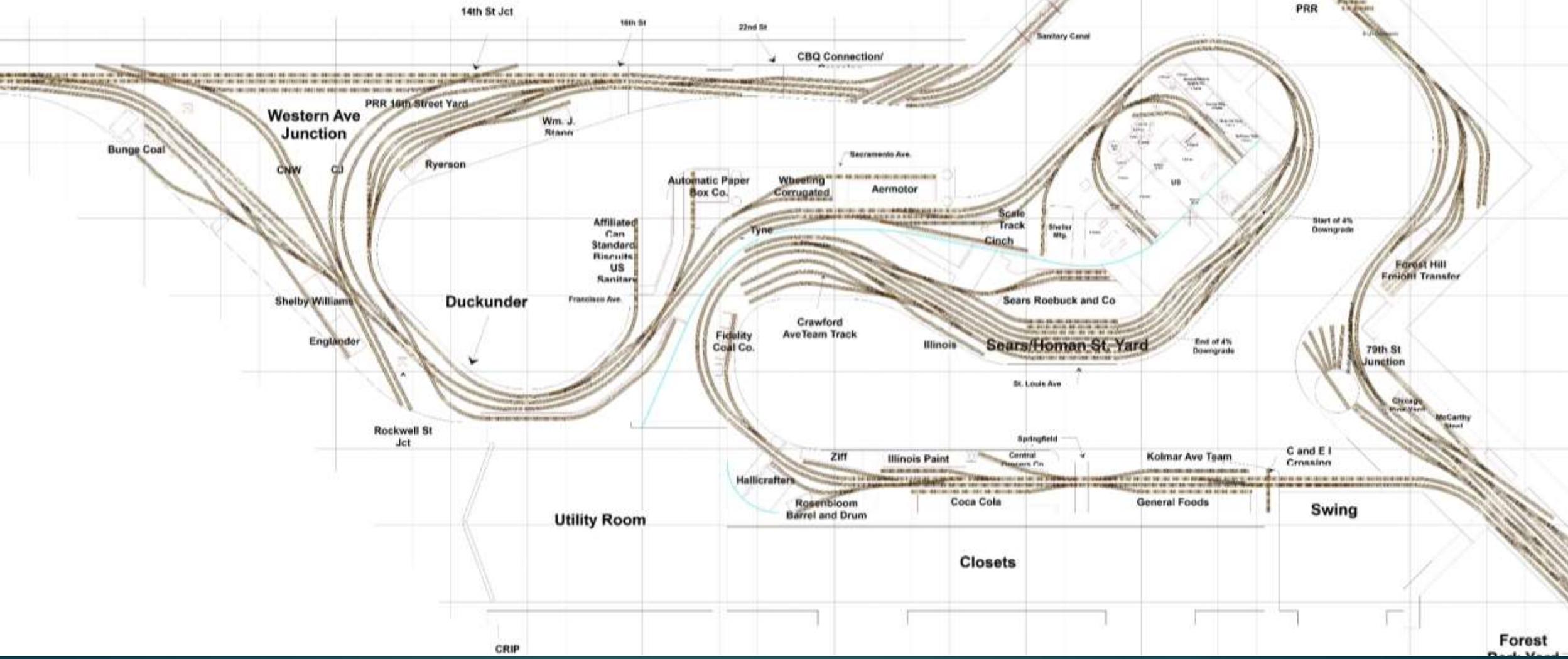
## Stage One



## Stage Two



# Stage One: Mainline and Branchline from Staging



# 63<sup>rd</sup> St. Station



Built by Allen Keller



# 63<sup>rd</sup> St. Station



# Second Floor Loading Docks

General Foods



Built by Herb Weiss



Affiliated Can  
Standard Biscuits  
US Sanitary

# Coca-Cola syrup plant



Built by Herb Weiss



D. W. Davidson, flickr.com

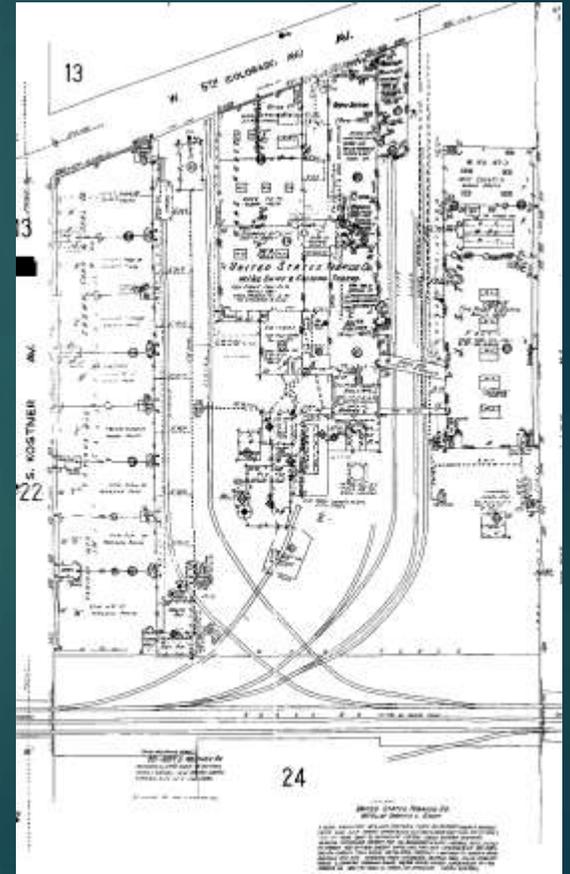
# U.S. Tobacco Complex



Built by Herb Weiss



Chicago Transit Authority



Sanborn Fire Insurance Map

# Getting Close to Operations



Active Staging Yard



Western Ave. Wye

# 24-Hour of Operations

## 98 Train Movements\*

- ▶ 11 Inbound Passenger Trains
- ▶ 12 Outbound Passenger Trains
- ▶ 5 Eastbound B&O Mainline Freights
- ▶ 4 Westbound B&O Mainline Freights
- ▶ 37 B&OCT Switching Runs
- ▶ 4 B&OCT Transfer Runs (Robey-Homan-Barr)
- ▶ 3 ATSF Transfer Runs
- ▶ 3 C&O/PM Transfer Runs
- ▶ 2 CB&Q Transfer Runs
- ▶ 2 CNW Transfer Runs
- ▶ 2 MILW Transfer Runs
- ▶ 2 Soo Line Transfer Runs, 4 Freight House Runs, 3 Produce Runs
- ▶ 1 PRR Transfer Runs
- ▶ 3 Wabash Transfer Runs

\* Only for Modeled Part of Railroad; 304 Recorded Moves for Entire Railroad

### Baltimore & Ohio Chicago Terminal

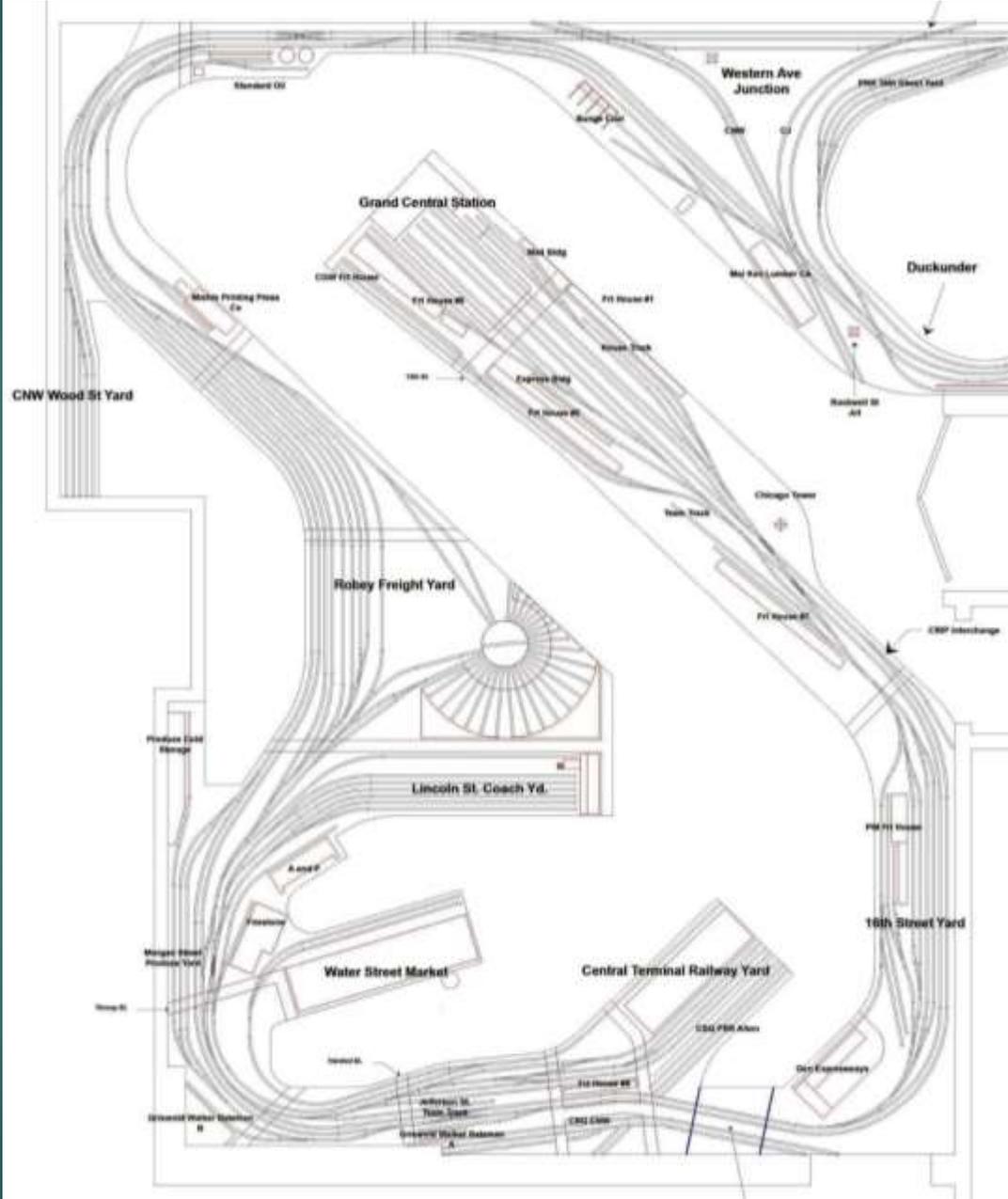
Summary of Freight Operations, Friday, February 7, 1958 - as taken from the Train Sheets. Listed in order B&OCT local runs, B&O through freights and then other roads moving on B&OCT tracks.

Note - Western Avenue Jct., Rockwell St. and 14th St. are three sides of wyes and yards - all adjacent, and this will explain times not matching up at those points. Also, many points are so close together, that train will go in yard at one point and come out at another. So far as possible, where there seems to be a continuous or immediate round-trip movement, the respective runs have been grouped.

B&OCT Runs							
Engine	From	Time	Cars	Arrive	Time	Cars	Notes
9050	Barr Yd.	12.01A	35-12	Bl. Isl. Jct.	12.17A	35-12	
	ret. Bl. Island Jo.	9.51A	6- 9	Barr Yd.	-	6- 9	
9045	Halsted St.	12.25A	0- 0	16th St.	12.32A	0- 0	
	ret. Chicago	2.14A	7- 0	Halsted St.	2.19A	7- 0	
9048	46th Avenue	12.27A	57	Spfld. Ave.	-	57	
9601	Barr Yd.	12.29A	2- 0	Yard 22	12.50A	2- 0	
	ret. Bl. Isl. Jct.	2.05A	0- 2	Barr Yd.	2.15A	0- 2	
9602	Barr Yd.	12.50A	7- 7	Bl. Isl. Jct.	1.04A	7- 7	GTW & IHB
	ret. Bl. Isl. Jct.	2.16A	0- 0	Barr Yard	2.30A	0- 0	
9510	75th Street	12.57A	11	West. Av. Jct.	1.33A	11	
8416	Spfld. Ave.	1.14A	0- 0	Sacramento Av.	1.31A	0- 0	
9600-9605	Whiting Jo.	2.09A	78-26	14th Street	5.06A	53-22	No. 210
	con. Rockwell St.	5.11A	53-22	48th Ave.	6.09A	20- 7	"
	ret. 48th Avenue	6.48A	6- 7	Rockwell St.	7.16A	6- 7	"
9607	59th Street	2.30A	13-17	Barr Yard	3.25A	13-17	
9040-8416	Sacramento Av.	2.31A	0- 0	48th Avenue	2.46A	0- 0	
9048	Whiting Jct.	2.35A	26-38	Barr Yard	3.36A	26-38	
9601	Barr Yard	2.50A	15-35	79th St. Jo.	3.27A	15-35	
	ret. 79th St. Jo.	4.55A	26-58	Barr Yard	5.45A	26-58	
9509	Central Ave.	2.59A	15- 5	Sacramento Av.	3.35A	15- 5	
8416-9042-							
9507	48th Ave.	3.33A	0- 0	Halsted St.	4.50A	0- 0	
9606	Rockwell St.	3.25A	43-10	Ash Street	3.50A	43-10	
	ret. Ash Street	4.44A	0- 0	14th Street	4.55A	0- 0	
9603	Barr Yard	3.39A	2-11	Brick Co.	3.57A	2-11	
	ret. Brick Co.	4.00A	2-11	Barr Yard	5.31A	6- 5	
9045	Halsted St.	4.13A	9	Chicago	4.20A	9	
	ret. 16th Street	7.21A	0- 0	Halsted St.	7.26A	0- 0	
9051	Barr Yard	4.35A	24-32	East Chicago	5.15A	24-32	
	ret. Whiting Jo.	5.25A	0- 0	Barr Yard	5.49A	0- 0	
9041	West. Av. Jct.	5.19A	0- 0	St. Louis Av.	5.27A	0- 0	
	con. Sacramento Av.	7.22A	0- 0	Spfld. Ave.	7.37A	0- 0	



# Stage Two Later This Year



# Some Modeling Challenges

## Elevated Railroad



You have to think in three dimensions when you design and construct the railroad

## GCS Train Shed



Large clear span structure that has to be designed so it can be removed to reach tracks

## Bascule Bridges



Building one Bascule bridge would be bad enough, but we are going to need two of them

# Modeling Opportunities

## Chicago: One of Last Places B&O Ran Steam



Mark Vogel Collection



Steve Given Collection

### **B&OCT Class L-3, 0-8-0 Switchers**

- ▶ Converted from 2-8-0's, circa 1930-34
- ▶ Five still in service until Nov. 1958
- ▶ Owned and lettered on tender for Baltimore and Ohio Chicago Terminal Co.

### **B&OCT Class Q-1 2-8-2 MacArthur (Mikado)**

- ▶ Built 1913; Retired 1949-55
- ▶ Lettered Baltimore and Ohio on tender
- ▶ Small placard over pistons lettered B&OCT

# Modeling Opportunities

Some big steam ended their days in Chicago



John Dziobko, Jr

## **B&O Class T-3, 4-8-2 Mountain**

- ▶ Built at Mount Clare in 1942-46; Retired 1956-60
- ▶ Some ended their days leased to the B&OCT to run transfers between Robey, Homan and Barr Yards



John Dziobko, Jr

## ▶ **B&O Class P-7, 4-6-2 Pacific**

- ▶ Built as President Series Feb, April 1927; Retired 1956-57
- ▶ Frequently assigned to the Shenandoah, Train 7/8, to and from Grand Central Station

# B&OCT Diesel Switchers

## Uniquely Lettered and Painted



### EMD SW1 Switcher

Al Chione Collection

- Class DS-3E
- Built in May, 1942
- Owned by and lettered B&OCT
- 6 units
- Numbers, 216-221 (8416-8421)



### Alco S2 Switcher

- Built in Feb.-May 1945
- Class DS-5A
- Assigned to and sublettered B&OCT
- 13 units
- No. 496-508 (9040-9052)

### EMD NW2 Switcher

- Built in Jan., 1943
- Class DS-4E
- Assigned to and lettered B&OCT
- 3 units; 409-411 (9509-9511)



### EMD SW9 Switcher

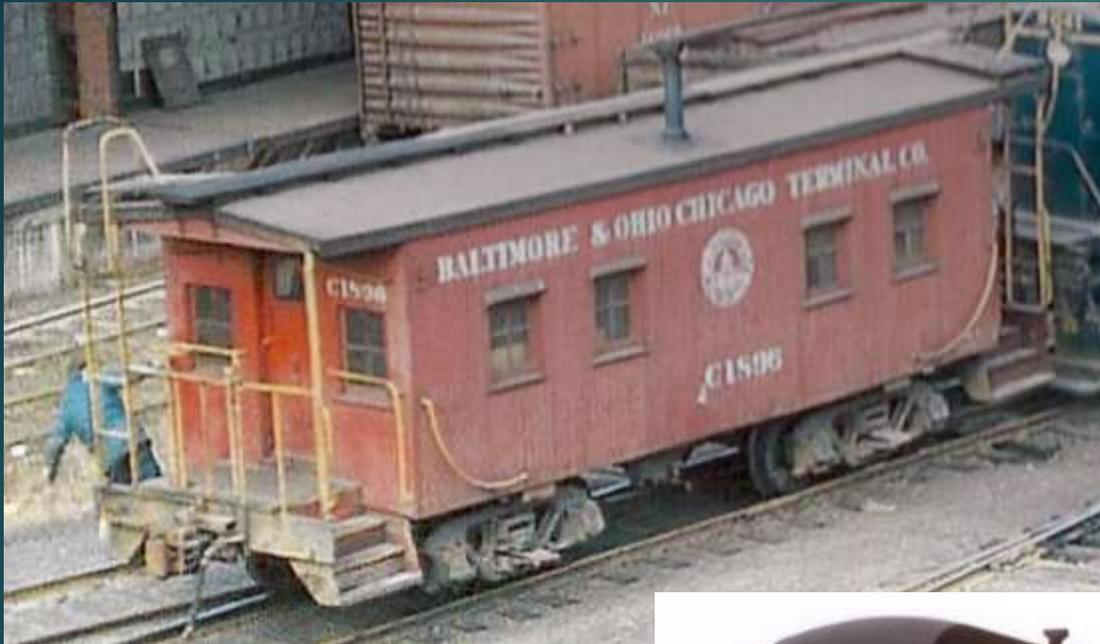
- Built in Mar.-Apr., 1952
- Class DS-17EC
- Owned by and lettered B&OCT
- 8 units; 590-597 (9600-9607)



Marty Bernard

# Modeling Opportunities

## Uniquely Lettered Caboosees & MOW Cars



20 cabooses were lettered for the B&OCT, with most of them being Class I-1a without cupolas



Only one B&OCT caboose had a cupola



18 work equipment cars were lettered for the Baltimore AND Ohio Chicago Terminal, Co.

# B&OCT Today: Last Stand of the Capitol Dome



- One of four 2015 switching roads in Chicago
- 78.21 miles of railroad, trackage rights in Chicago and vicinity
- Freight Terminals; 47 Industries
- Connects with CSX at Pine Junction, Ind

canadianrailwayobservations.com

The only place in the modern railroad world that the B&O logo is still displayed

Source: B&OCT Web Site

# Branchline Lighting: Dimmable LEDs



Phillips, 60 Watt,  
LED, Daylight



Ductwork slimmed down, routed over peninsula

# Branchline Valance: Galvanized Flashing



Covered 96 feet  
with one seam

Magnets stick to it

