Modelers Guide to



Using Timelines to Select Eras & Focus Your Modeling





Part 2

By John Burchnall

Why Use Timelines?

- Offer guidance in deciding which era and locale to model
- Help focus your modeling and purchases
- Add interest and uniqueness
- Doesn't matter if "anything goes" on your model railroad

Typical Modeler Q's

- What era and locale to model?
- Which railroads existed then?
- Which railroads to model?
- What locos and cars existed?
- What other technologies and icons are valid for your era?
- Where to find all this info?



- Rail Eras, Safety & Regulatory
- Railroad Technology Changes
- Steam Locomotives
- Automobile Companies
- Gas Stations / Oil Companies
- Road Signs & Markings
- Hamburger Chains



- Railroad Maps & Mergers
- Diesel & Electric Locomotives
- Railroad Bridges & Trestles
- Farm Tractors
- Soda Bottles and Advertising
- Grocery Stores & Trading Stamps
- Other Study Areas

Information Sources

This work includes comprehensive original schematic visual presentations of historic events and interactions across timelines for a number of subject categories. The analyses, comparisons, derivations, modeling aids, enhancements and new representations and insights of these matters are by the presenter. Heralds, logos and graphical images from 3rd parties are used here under fair use doctrines for educational and research purposes. Data sources include -

Wikipedia

- Kalmbach Magazines & Books
- NMRA Data Sheets (current & archived)
- Other Internet Sources

Kalmbach References



Timeline Trivia Q's 2

- When did the modern rail merger era start?
- Which NA railroad is "tri-continental"?
- What was Alco's most popular diesel loco?
- How many turbine designs have been tried?
- Which bridge types dominate railroading?
- What drove steel replacing iron in bridges?
- Which farm tractor co. dominated most yrs?
- How many farm tractor co's in NA today?
- When was the iconic coke bottle designed?
- When were trading stamps most popular?



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North America RRs Today



Regional Groupings?



Mega Railroad Systems



- Penn Central/Conrail, CSX, NS

Modern Merger Era

Modern Merger Era began 1959/60

- 1959 Virginian → N&W
- 1959 Charleston & Western Carolina → ACL
- 1960 Erie + Delaware Lackawanna & W. = EL
- 1960 Minneapolis & St. Louis → C&NW
- 1960 Duluth South Shore & Atlantic → SOO Line

Notable Pre-1959 Acquisitions

- 1947 Pere Marquette → C&O
- 1947 Denver & Salt Lake (Moffat Rd) → D&RGW
- 1947 Alton Road → Gulf Mobile & Ohio
- 1951 Savannah & Atlanta → Central of Georgia
- 1957 Nashville Chattanooga & St. Louis → L&N

NA Railroad Mergers

Full Timelines

Two Systems per Page Four Pages Total Small Print (Reference Only)

NS and Conrail



CSX and KCS



BNSF and UP



CN and CP



NA Railroad Mergers

Zoomed Timelines

Active Merger Years One System per Page 8 Timelines and 9 Maps Most Useful for Modeling

Conrail 1976-1998



Conrail Breakup



Conrail History



Norfolk Southern



Norfolk Southern History







CSX History



Burlington Northern Santa Fe



BNSF History



Union Pacific



Union Pacific History



Canadian Pacific



CP/SOO History



Canadian National



CN/GT History



Kansas City Southern



KCS History


Merger Observations

- Some mega RRs have complex lineage
- Identities complicated by leasing, control, ownership, absorption
- 1976-1998 Conrail monopoly in NE
- Mega mergers occurred first within East and also at BNSF
- CN, CP, UP big merges happened later
- Soo = CP's "agent" in USA
- GT = CN's "agent" in USA

Merger Observations

- Portions of dissolved Rock Island and Milwaukee ended up in other roads
- Many multi-RR locations making great modeling subjects
- KCS solvent due to ownership of best rail link into Mexico
- CN spans 3 coasts, including North-South in Mid-America
- CP &/or CN with KCS would create an interesting Mexico/Canada/USA line

CN, CP and KCS



Shortlines & Regionals

Could also plot timelines and maps for shortlines and regionals, such as -

- Genesee & Wyoming
- PanAm Railways
- Rail America
- RJ Corman
- Watco



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Diesel & Electric Locos

- Fairbanks-Morse/CLC
- Baldwin/CLC
- Lima-Hamilton





BLH







- ALCO/MLW/Bombardier
- GE/Wabtec



- GM/EMD/Progress Rail
- Other











Lima – Hamilton





Too little, too late – Lima began diesel loco program in 1947 by merging with engine maker Hamilton with their turbocharged 6 to 8 cylinder in-line diesel, then both merged in 1950 with Baldwin to try to survive

Baldwin Locomotive Works



BLW made small gas mech. locos from 1910-1938, then with Westinghouse until 1953 to build diesel-elecs (GE thereafter), using 6-8 cyl. turbo and non-turbo De La Vergne marine diesels

Fairbanks – Morse



Used proprietary opposed piston marine diesel engine, with Westinghouse motors and electrical gear until 1953, thereafter its own electrical gear, plus a GE option

ALCO / MLW / Bombardier



Co-built electric locos with GE since 1906, added Ingersoll-Rand in 1920's to build 1st std diesel-electric loco - acquired McIntosh & Seymour Engine Co in 1929, eventually developing 3 models of 6, 8, 12, 16 cylinder diesels, most turbo-charged

GE / Wabtec Freight Locos



GE Passenger Locomotives



EMD/Progress Rail Freight



Industrial & Other

SD45, SDP45

Road Switchers

EMD (Diesel) to Progress Rail

All Union Pacific: DD35 DD35A

SD4

DDA40X

Winton Engine in 1930, becoming EMD Div. in 1941. Used GE and Westinghouse electricals until 1938, then own. Developed own 201-A, 567, 645, 710, 1010 engines. 2010 sold to Progress Rail.

Tier 3 Tier 4 Tier 1 Tier 2 1980 2000 2010 2020 1970 1990 200 SW1001 SW1000, SW1500 MP15DC, MP15AC **MP15T** SW1504 GP38-2L GP15-1 AC/T GP39,SD40A BL20-2 SD75I **GP35** GP38 AC GP38-2/2W **SD75M/80MAC** GP/SD28 SD(P)38 SD60M(AC) SD60I SD70I AC GP39-2 **SD60** GPxD GP15/20D Caterpillar SD70ACS GP40(P) GP40-2, GP40X GP49 **GP60** SD90MAC SD80ACe SD(P)35 SD(L)39 SD38-2 GP50, SD50 GP59 GP60M SD70M, SD70MAC SD70M-2 SD70ACe-T4 SD40X SD40, SDP40 SD40-2 **SD70** SD70ACe SD45(T)-2 SD40T-2,SD40-2W SD45. SDP45

D35 DD35A

DDA40X

EMD/GMD Passenger Units



Turbines & Other Passenger



Other Passenger Motive Power



Locomotive Observations

- Each builder has unique model code typically horsepower, body type and wheel configuration
- Most builders had Canadian
 "partners" (CLC, MLW, GMD)
- Lots of make/model variety in the 1945-60 "Transition Era"
- Lima-Ham. made 4 models over 3 year span, then merged with Baldwin

Locomotive Observations

- GE started with boxcab electrics in 1930's and 1940's, then made its own switchers while partnering with ALCO
- Much turbine and passenger experimentation from 1940-80
- 5 types of turbines tried UP's Gas Turbine Electrics most successful
- Longest life self-powered pass. cars were Budd RDCs & Budd Metroliners

Locomotive Observations Variety of passenger locos over time: **Diesel Pass. Locos by Era** • 1946-1953/5 Alco PA's, BLW Sharks

- 1934-2001 EMD (E's, FP's, SDP's, F's)
- 1990-2002 <u>GE</u> P32/40/42 Genesis Series
- 2016-now <u>Siemens</u> Charger

Electric Pass. Locos by Era

- 1910-1992 Many <u>GE</u>'s (L. Joe, GG1, E44, ...)
- 1978-1998 <u>EMD/ASEA</u> "Toasters"
- 2015-2018 <u>Siemens</u> Sprinter
- 2000-now <u>Bombardier/Alstom</u> Acela/Avelia



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Bridges, Bridges, Bridges



40+ Types of Bridges in the World !

Bridge Definition

"A bridge is a structure built to span a physical obstacle (such as a body of water, valley, road, or rail) <u>without</u> <u>blocking the way underneath</u>.

It is constructed for the purpose of providing passage over the obstacle, which is usually something that is otherwise difficult or impossible to cross."

Wikipedia

Bridge Design Factors

"Designs of bridges vary depending on factors such as: the function of the bridge, the nature of the terrain where the bridge is constructed and anchored, and the material used to make it and the funds available to build it."

Wikipedia

Bridge Basics

How many general bridge forms are relevant for railroads?



Railroad Bridge Basics

3 General Forms

- Beam
- Arch
- Truss

4 Material Fields

- Masonry
- Wood
- Metal
- Concrete

3 Sub-Types

- Deck
- Through
- Pony



4th Bridge Form?

The Lowly Fill

- Simple and cheap
- Does provide passage over a chasm
- But technically not a "bridge" – unless add an opening (culvert)

Fill





4th Bridge Form?

The Lowly Fill

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Specific Bridge Types

- Arches and Culverts
- Trestles and Viaducts
- Beams and Girders
- Simple, Continuous and Cantilever Trusses
- Movable Bridges
 - Swing
 - Bascule (Hinge or Roll Up)
 - Vertical Lift

Suspension & Cable-Stayed Bridges

Trestles and Viaducts

- Trestles and viaducts are bridges, each composed of beams, arches and/or trusses
- A trestle is a viaduct but not necessarily vice versa
- Trestle = succession of usually <u>open</u> towers (or <u>bents</u>) supporting <u>short</u> spans
- Viaduct = succession of closed (piers) or open towers supporting either long or short spans
- Viaducts typically have towers/piers that support much <u>longer spans</u> and are <u>taller</u>

Notable Truss Designs



Bridge Material Timelines



Bridge Type Timelines

L830	1840	18	50	1860	1870	1880	1890	1900	1910	1920	193	0 1	940	1950	19	960	19	70	198	0	1990	20	000	201	0 20)20

ARCHES



Bridge Technology Eras

1 st Generation	2 nd Generation	3 rd Generation	4 th Generation
Pre 1845	1845 – 1890	1890 – 1955	Post 1955
Earth Fill	Wrought Iron Beam, Girder, Truss and Arch	Rolled Steel Beam	Welded Steel Girder and Box Beam
Short Wood Beam, Trestle and Truss	Tall Wood Trestle	Riveted Steel Girder, Trestle & Moving Bridge	Welded Steel Trestle with Rolled Shapes
Cast Iron Beam	Wood Truss	Riveted or	Prestressed
	With Wrought	Pinned Steel	Concrete Slab
	Iron Rods	Truss and Arch	& Shaped Beam
Masonry Arch	Non-Reinf.	Reinforced	Prestressed
	Concrete Piers	Concrete Beam,	Concrete
	and Footings	Slab and Arch	Viaduct

Railroad Bridge Spans

Real World Typical Maximum Spans in Feet

Туро	Matorial	1st Gen.	2nd Gen.	3rd Gen.	4th Gen.		
туре	Materiai	Pre 1845	1845 - 1890	1890 - 1955	Post 1955		
	Wood	30-100	50-200	-	-		
	Iron	150	400	-	-		
Arch	Steel	-	100-700	100-1000	100-1600		
	Masonry	100	200	300	-		
	Concrete	-	100	50-200	(300)		
	Wood	20	20	15	10		
	Iron	20	30	-	-		
Beam or Slab	Steel	-	-	20-40	20-40		
	Reinf.	-	-	10-20	20-40		
	Prestressed	-	-	40	50 Bm, 100 Gir		
Plate Girder	Iron	30	60	-	-		
Flate Girder	Steel	-	30-100	40-150	50-200		
	Wood	25-100	50-150	-	-		
Simple Truce	Iron	-	50-200	-	-		
Simple Truss	Steel	-	50-300	50-600	100-800		
	Concrete	-	-	-	(200)		
Continuous Tr.	Steel	•	400	300-800	400-1000		
Cantilever Tr.	Steel	•	200-1000	300-1500	400-1800		
Suspension	Steel		800	400-2300	(400-2300)		

Models often need to be much shorter

Bridge Modeling Tips

- Pick type, materials and sub-type per span, era and clearance needs
- Selectively compress the span
- Loco loading also a design factor
- Post 1970 approx. real world spans:
 - <50' Beam (30-40' for Trestle spans)
 - 50-100' Concrete Girder or Box Beam
 - 100-200' Steel Plate Girder
 - >200' Steel Truss/Arch or Concrete Arch

Railroad Bridge References





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Farm Tractors

- Kubota
- John Deere
- · J. I. Case







KUBO.

TRACTORS







Kubota



































AGRICULTURE

NEW HOLLAND

Caterpillar

International Harvester

Allis-Chalmers

Fordson / Ford

New Holland

- Oliver / White
- Minneapolis-Moline
- Massey Ferguson

Farm Tractors



AGCO

Growth in Farm Tractors

- Tractors replaced horses over a 50 year span, at ~ 1:6 ratio
- Horses peaked WWI
- Tractor production peaked post WII



US Tractors Made



Tractors vs. Horses on US Farms

Graphs from White, William. "Economic History of Tractors in the United States". EH.Net Encyclopedia, edited by Robert Whaples. March 26, 2008

Many Tractor Varieties



Farm Tractor Eras



Farm Tractors



Farm Tractors



Farm Tractor Models

See websites for specific model names and production years



2006 charts by Bill Ganzel of the Ganzel Group, from Wessels Living History Farm website.



Tractor Market Shares

- International Harvester dominant, except for low cost Fordson in 1910's & 1920's
- Ferguson 3-pt hitch made Ford return successful in late 1940's and early 1950's
- Deere, MF & A-C also built solid shares

	1910s	1920s	1930s	1940s	1950-55
Deere	4%	6%	22%	17%	15%
International Harvester	21%	29%	44%	33%	31%
Ford	20%	44%	0%	8%	19%
Massey Ferguson	3%	2%	3%	15%	11%
Case	7%	4%	7%	8%	5%
Allis-Chalmers	6%	4%	13%	10%	10%
Oliver	2%	2%	5%	5%	5%
Minneapolis-Moline	8%	1%	3%	3%	4%
All Others	28%	9%	3%	3%	0%

US Market Share of Wheeled Tractor Manufacturers

Farm Tractor Colors

Some brand colors iconic, others changed over time

Kubota Waterloo John Deere J. I. Case International Harvester Case IH Fordson Ford New Holland Caterpillar **Allis-Chalmers** Cockschutt Hart-Parr Oliver White **Minneapolis-Moline Massey Ferguson**



Orange **Green/Red** <u>Green/Yellow</u>; also pink, wht, or yel Red; Tan/Org; Yellow/Gray Flambeau Red (Farmall) **Flambeau Red** Blue w/ Org Whls; Org; Dk. Green Grey; Red/White; Blue/White Blue Yellow/Orange Persian Orange Red Green w/ Red Wheels Green w/ Red Wheels White/Gray/Silver **<u>Prairie Gold</u>** (Tan Orange) Yellow; Black/Red w/ Silver



Timelines Part 2

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Soda Logos Over Time



Script era for both Coca-Cola & Pepsi-Cola Additional graphics and some simplified brand names

- Coca-Cola briefly just Coke
- Pepsi-Cola becomes Pepsi

Soda Logos Over Time



Coke Bottles Over Time



1899-1902

1900-1916



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Grocery Stores

- Could display by Era and Region
- Chains over time –

A&P (Albertsons), **Acme** (Albertsons), **Albertsons**, Aldi, Biggs, Costco, Food Lion (Ahold), Food Lane, Fred Meyer (Kroger), Fresh Market, Giant (Ahold), Giant Eagle, Grand Union, Harris Teeter (Kroger), IGA, Kroger, Lidl, Meijer, Pathmark (Albertsons), Piggly Wiggly (1916), Publix, Safeway (Albertsons), Save-A-Lot, Sam's Club (Walmart), Shoprite, SuperValu, Tesco, Trader Joe's (Aldi), Walmart, Wegmans, Whole Foods, Winn-Dixie

Grocery Stores



Most Food Stores per State



Grocery Stores



Grocery Stores



Trading Stamps

1910-2008 Customer loyalty programs 1957 peak, 1970's decline, 1990's ceased



Trading Stamps



avier upon en in

ALL LINES, MIT. "TOPPOT" DESIGN Lesson 1 good lines 18 a 27 . I fair ALASSE ELDER: NO

TOP VALUE ENTERPRISES, INC., Top Value Bidg., Dayton I., Ohio





Top Value. **STAMP BOOK**

GREEN



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SEE IMPORTANT INSTRUCTIONS INSIDE

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for you...see inside!



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Automobile Tire Co's

- Could display by Era and Region
- Companies / brands over time –

Admiral, Alliance, BFGoodrich, Bridgestone, Continental, Cooper, Dunlop, Firestone, General, Goodyear, Michelin, Patriot, Pirelli, Sebring, Sumitomo, Toyo, Uniroyal

 Recent NA Market share leaders – 20% Goodyear, 19% Michelin, 17% Bridgestone, 9% Continental, 5% Pirelli

Department Stores

- Could display by Era and Region
- Chains over time –

Sears, Kmart, JP Penney, Saks, Belk, Woolco, Woolworth, Kohls, Pogue, Ayres, Shillitos, Macy's, Neiman Marcus, Zayre, Nordstrom, Dillard's, Meijer, Roses, Target, T.J. Maxx, Federated, May, Lazarus, Hills, Hecht's, Strawbridge's, Kaufmann's, Woodward & Lothrop, Wanamaker's, Marshall Field's, Elder-Beerman, Gaylords, Heck's, Mabley & Carew, McAlpin's, Swallen's, Van Leunen's, Walmart, ...



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More Timelines?

- Rail Car Builders pass. and freight
- Cranes & Construction Equipment
- Coaling Stations wood, steel, conc.
- Water Towers wood, steel, conc.
- Farm Silos wood, porcelain, Conc.
- Barn Types by era and region
- Heavy Trucks and Fire Engines
- Bicycles & Motorcycles
- Airplanes & Airline Companies

More Timelines?

- Stoplights & Streetlights
- Sidewalk Details (Hydrant, Mailbox ...)
- Utility Poles & Lines
- Drug Stores (Rexall, SuperX ...)
- Hardware Stores (Sears, Ace ...)
- Automotive Parts Stores
- Clothing & Furniture Stores
- Consumer Electronics TV, Radio, ...
- Other Retail Stores

More Timelines?

- Fast Food Chicken, Pizza, Subs, ...
- Ice Cream (Good Humor, Sealtest, ...)
- Donut Shops
- Other Restaurants
- Coffee Brands
- Salted Snacks Pretzels, Potato Chips
- Candy/Chocolates (Hersey, Cadburys)
- Chewing Gum (Wrigley, Bazooka, ...)
- Cereal Brands Kellogg, Post, ...

Example Uses

Gary Hoover's N&W



The Eastern Loggers

- Why early 1920's?
- Near end of logging boom
 - diverse wood product industries
 - petrochemicals emerging
- All steam mostly geared locos
- 36 ft freight cars dominant
- Mix of horse & buggy, plus autos
- Minimal regulations (EPA, OSHA, ...)
- Roaring Twenties (pre-depression)

Why 1959 in Appalachia?

- Coal, cabooses, helpers still king
- Mostly 40 foot freight cars
- All 1st and some 2nd gen. Diesels
- Right before the mergers era
- Railroads still fairly healthy
- Passenger trains still running
- Mountains enable long runs on single level pike via parallel high-low mains
- Vertical scenery w/ bridges & tunnels

Why not Multiple Eras?

- Some modelers have locos, vehicles and rolling stock from multiple eras
- These charts could be used to divide equipment stashes into specific eras
- Then run different era-specific oper. sessions on different days using the appropriate group of rolling stock
- Most structures and scenery can pass for a wide range of time

Wrapup

- Now all this valuable historical data is in one place
- Use it to focus your modeling and purchases, plus add interest and uniqueness to your layout
- All slides are on the Modelers Aid tab of Cincinnati Division 7, MCR website (www.cincy-div7.org)
