THE WHISTLE

The official publication of:
THE BRITISH COLUMBIA SOCIETY OF MODEL ENGINEERS (BCSME)
Operators of BURNABY CENTRAL RAILWAY Vol 56; Issue 5 – September/October 2026

Clive Ellis with Bob Kitson's 'King' (Glvr.), Milner (Langley) Club Track – June 1958. Photograph courtesy of Marjorie Carroll

BCSME Director Meetings

Join Us for Our Monthly Board Meetings!
The Board of Directors meets on the last Wednesday of each month at 7:00 PM. Members are invited to attend, listen in, and stay informed on upcoming society plans.

In This Issue

The Whistle is the official newsletter published by, and for, the members of The British Columbia Society of Model Engineers (BCSME). Any opinions expressed herein do not necessarily reflect the policies of The BCSME. All content is the copyright property of The BCSME, and the individual contributors.

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Submissions & Deadline

The editor's role is to assemble and publish the newsletter, but it truly serves as a platform for members to share their BCSME stories with one another. Your contributions make The Whistle vibrant and meaningful.

If a BCSME member has any articles or photos that they'd like to submit for publication, please send them to the editor as an attachment in an e-mail.

Please add the words "The Whistle" in the e-mail's subject line. The more submissions made by members of the Society the better this newsletter will be.

The deadline for any submissions is one week prior to an issue being published. New issues are published every second month, starting at the beginning of January.

Means of Publication

I use Apache's OpenOffice suite on a PC to create this newsletter. OpenOffice can open almost any Microsoft document file.

Photos are handled using GIMP. Any digital pictures being submitted for publication should be in as high a resolution .jpeg format as possible. 200 DPI is a good value.

The BCSME Directors

President .....Peter Berry
Vice-president.....More McCormack
Secretary.....Tom Carr
Treasurer.....Brian Carlson
Business Director.....Gord Tilley
Site Manager.....Matthew Berry
Operations Director.....Bruce Wilson
Shop Director.....Chuck Laws
Communications Director .....Marie Rogers

Officers

Financial Review.....Bill McKenzie
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Security Access.....More McCormack and Dennis Bosa
Garden Railway Project Manager.....Dennis Bosa
Boiler Inspector.....Steve Harvey
Archivist.....**Vacant Position**
Librarian.....**Vacant Position**
The Whistle Editor.....Brian Ruebottom
Comm. Chair, Garden Railway.....Brian Ruebottom
Comm. Chair, Raised Track.....Doug Bach
Trainers/Examiners.....Doug Bach and Bruce Wilson
Steam Instructor.....John Ostler
Shop Frm.....Bruce Johnston (M) and Phil MacGregor (C)
Social Media Manager.....John Roberts
New Steam Loc. Project Mgr.....Chuck Laws
Comm. Chair, 100th Ann...Tom Carr and Kent Cavaghan

CALENDAR OF EVENTS

***Also check:* www.bcsme.org**

2026 Play Day Calendar
From 3:00 PM to Dusk
Friday - September 18th

Come celebrate Thanksgiving with good food and great company on Saturday, October 10, starting at 6:00 PM. Seats are $25.00 per person. Save your spot today!

Chilliwack Heritage Park
Train & Hobby Show – Oct 24th and 25th

Contact for BCSME Concession and Bookings

Gord Tilley: concession@bcsme.org / **Bruce Wilson:** bookings@bcsme.org

President's Message

Ridership continues to fluctuate based on the weather, with sunny days bringing out large crowds and overcast days seeing lighter turnout. Despite these shifts, our overall ridership and revenue remain on par with our 2025 season. Most encouragingly, our reviews across social media platforms continue to highlight exceptionally high ratings for both our overall operations and entertainment value.

Our "Join Us" campaign is maintaining its strong momentum, successfully attracting new members through targeted digital outreach. We are also continuing to welcome walk-in visitors who drop by after passing the park. On Monday, August 24th, we capped off a major media blitz by hosting Volunteer Discovery Day to welcome potential members. Visitors enjoyed guided tours of the facility, rode our trains, and learned firsthand about our society's day-to-day operations.

I extend a sincere thank you to all the dedicated members who stepped up for Volunteer Discovery Day. Your willingness to come out, greet our neighbours from the surrounding community, and answer a wide array of questions made the event a tremendous success. By sharing your enthusiasm for our mini train operations and site history, you provided a welcoming atmosphere that showed our guests exactly what makes our society so special.

Happy Steaming, Peter Berry, President, BCSME

Editor's Message

This year, 2026, is a very important year for Jayden and Kai. Both of these two volunteers have been coming out to the park for most of their lives, and this year they became engineers for the BCSME. Congratulations!

Chuck Laws sent in the photograph of Jayden driving Chuck's locomotive #459, and Heidi Goto sent in the photograph of Kia on #9000 prior to his first public run day at the BCSME.

Brian Ruebottom
Editor, The Whistle
Committee Chair, Garden Railway

JOB JAR

Item 1: Bruce has many small jobs in Operations. If you can help, please contact him at bookings@bcsme.org

ITEM 2: The Track Gang - if you can help, please contact More McCormack at vicepresident@bcsme.org

ITEM 3: The Garden team is in critical need of help on Tuesdays. Please contact Catherine at 604-420-1778

Reminder: For members who frequent the park – please walk the tracks when you arrive at the park and help with keeping the tracks free of debris.

Volunteer Discovery Day

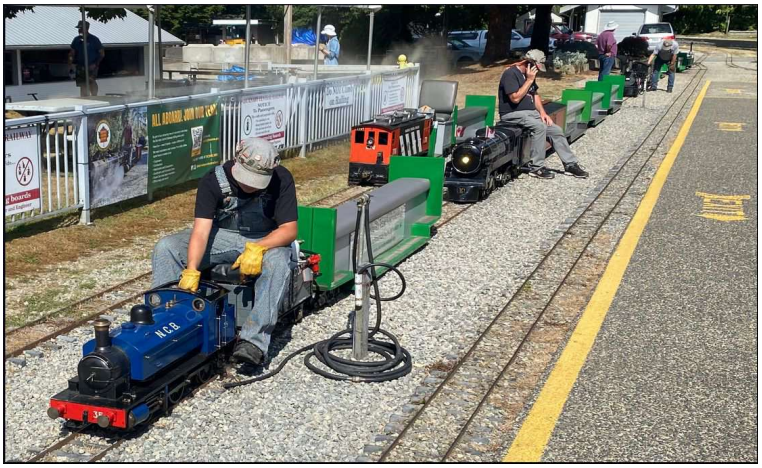
By Marie Rogers
Communications Director

We held an event on Aug 24th, called Volunteer Discovery Day, aimed at attracting new members. The event was promoted on Facebook, Instagram, and through direct communication with organizations we've been courting. By all accounts it was a success: over 20 groups of people came to check us out, resulting in 8 new members that day, with more to come, no doubt. Welcome to Tim, Steve, Allison, Chris, Jess, Richard, Robert and Mark! A big thank you goes to our BCSME members who came out to showcase what we do and make the day a success: Brendan, Daniel, Wayne, Kyle, Justice, Dennis, Doug, Francina, Catherine and Tom P, plus board members Peter, More, Tom C, Chuck, Gord, Bruce, and Brian. We will definitely do this again!

Photographs courtesy of Marie Rogers

Play Day: Friday July 24

Our Play Day on July 24 had a large turn out of visitors from other organizations with some of these visitors bring out their rolling stock. The CTTA, NMRA 7th Division, and members from VIME were invited in for the event. This led to an unexpected larger crowd for the night. The VIME members did stay and helped with running trains for the public over the weekend.



Photographs are courtesy of Brian Ruebottom

Around the Park

Two new ballast bays were set up in the main parking area. The work was completed by friends of the society.

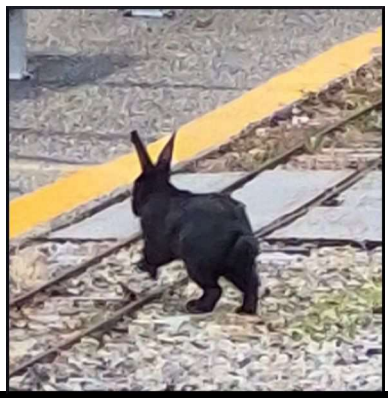
Photograph courtesy of Brian Ruebottom.

New patio stones were placed down to extend the patio area east of the Garden Railway. The grass was removed and the area was levelled with gravel. Friends of the society levelled the ground, while Vanscape Contracting installed the new patio stones. Temporary fencing is currently in place that encloses both tents.

Photographs are courtesy of Brian Ruebottom.

If you have been at the park in the last two months you may have spotted a pair of rabbits, one black and the other dark grey. There is also rumour of a coyote chasing one, and recently I have only noticed the black rabbit... hmm... Thinking about this as I prepare the issue for publishing, I have not seen the black rabbit for the last couple of weeks.

The photograph to the right is courtesy of Chuck Laws.



The Evolution of Locomotive Power: The 4-6-6-4 Challenger
Author: Brian Ruebottom

At the close of 1925, the Union Pacific (UP) System operated a massive network of 9,834 miles (15,826 km) of routes, ruling as a colossus of the American West.[1] This vast empire stretched from the Pacific gateways of Los Angeles, Portland, and Seattle to its easternmost terminal points on the banks of the Missouri River at Omaha, Nebraska, and Kansas City, Missouri. Because Union Pacific relied on hauling heavy, mile-long trains across immense distances, the railroad faced a brutal mechanical paradox: locomotives had to climb the formidable mountain grades of Wyoming's Sherman Hill and Utah's Wasatch Range, yet sprint across hundreds of miles of flat Nebraska prairie.

To solve this, Union Pacific and the American Locomotive Company (ALCo) introduced the revolutionary 4-6-6-4 Challenger in 1936.[2] The Challenger's design was born of a singular, ambitious goal: to replicate the capabilities of the railroad's two most successful, yet vastly different locomotives. Engineers sought to combine the high-speed capability of the three-cylinder, rigid-frame 4-12-2 "Union Pacific" type[3] with the immense, sure-footed pulling power of the articulated 2-8-8-0 "Bull Moose" Mallet.[4] By merging the best attributes of these two lineage lines, UP created a new class of high-speed, articulated steam that could effortlessly conquer both mountain and plain on a single run.

Before the Challenger redefined mainline operations in 1936, UP relied on a divided fleet to move tonnage across its vast Western empire. UP was forced to utilize two radically different locomotive classes, because no single locomotive could handle both the flatlands and the mountains efficiently. Each excelled in one environment but failed miserably in the other.

The Speed Demon: The 9000-Series 4-12-2 "Union Pacific" (UP) Type

To handle fast freight across the flat, straight expanses of the Nebraska plains, Union Pacific turned to the ALCo to build the legendary 9000-series. Entering service in 1926, this locomotive was so unique to the railroad that its 4-12-2 wheel arrangement was officially dubbed the "Union Pacific" type. It was officially designated as the 4-12-2, but it was never sold to any other railway company.[5] Type is always reserved for a locomotive that is used by two or more railway companies. Comparing this to the 4-8-8-4 Big Boys. The Big Boys were only used by UP and thus are not refereed to as a Type; ie., 4-4-0 American Type.

The 4-12-2 was a triumph of high-speed, rigid-frame engineering. It utilized a unique three-cylinder system: two standard cylinders on the outside of the frame, and a third cylinder hidden inside the frame, angled under the boiler to drive a special cranked second axle. This design produced an incredibly smooth, continuous power delivery that allowed these "Greyhounds" to sprint at sustained speeds of fifty to sixty miles per hour.

However, the 4-12-2 pushed rigid-frame technology past its absolute physical limits. To accommodate twelve coupled driving wheels on a single frame, the locomotive possessed a rigid wheelbase over thirty feet long. Despite lateral motion devices that allowed some side-to-side play on the outer axles, the 4-12-2 was a track-maintenance nightmare. On curves, the massive wheelbase acted like a giant wedge, grinding down steel rails and threatening to derail. When Union Pacific tried to run them on the winding mountain routes of the Pacific Northwest, they pounded the track beds so violently that they had to be permanently banned from mountain service and relegated strictly to flat territory.

1 Union Pacific Railroad - Wikipedia
2 4-6-6-4 "Challenger" Steam Locomotives in the USA
3 4-12-2 "Union Pacific" Locomotives: Specs, History, Photos
4 2-8-8-0 Locomotives: History, Photos, Development
5 Union Pacific 9000 Class - Wikipedia

The Mountain Muscle: The 2-8-8-0 "Bull Moose" Mallets

For the steep, twisting climbs of the Wasatch Range and Sherman Hill, Union Pacific relied on its fleet of seventy 2-8-8-0 "Bull Moose" Mallets, built by ALCo between 1918 and 1924. Unlike the rigid 4-12-2, the Bull Moose was a true compound articulated locomotive. It featured a hinged frame that allowed it to bend around tight mountain curves, and it recycled its steam from high-pressure rear cylinders to low-pressure front cylinders to maximize fuel efficiency.

The 2-8-8-0 were incredibly powerful and sure-footed. They could lug immense tonnage up gruelling mountain grades without slipping, but they were painfully slow. True to their "drag-freight" design, they crawled uphill at a sluggish ten to twelve miles per hour, and they struggled to exceed twenty-five miles per hour even on flat stretches. If crews tried to push them faster, the massive low-pressure cylinders would starve for steam, choking the locomotive's power.

The Mainline Bottleneck

The 4-6-6-4 Challenger was born out of UP's sheer geographic necessity. The railroad's transcontinental mainline crossed some of the most unforgiving terrain in North America, notably the steep, punishing grades of the Wasatch Mountain Range in Utah and the high-elevation climbs of Sherman Hill in Wyoming. By the mid-1930s, Union Pacific's mechanical department led by General Mechanical Engineer Arthur H. Fetters and his brilliant assistant Otto Jabelmann realized the railroad faced an existential problem.[1] To keep up with growing economic demands, they needed a locomotive designed to serve a dual-purpose environment.

This operational landscape of the American West was shifting rapidly beneath UP's rails. The onset of the Great Depression, paradoxically, did not slow down the demand for high-speed service; it accelerated it. Shippers transporting high-value Pacific Northwest lumber, fresh California produce, and time-sensitive livestock demanded unprecedented transit times. To remain competitive, Union Pacific could no longer tolerate the logistical bottleneck of operating two completely incompatible fleets. Fast freight trains pulled by a 4-12-2 would fly across Nebraska, only to hit the mountains and be forced to crawl behind a plodding 2-8-8-0 Mallet. Alternatively, the railroad faced the additional logistics challenge of switching out a locomotive at the divide of the mountains and the prairies, an intensive yard process of uncoupling, repositioning heavy power, and recycling air brake lines that burned critical minutes on the clock. The evolutionary stage was set for a machine that could merge these two distinct lineages into a single, high-speed, articulated powerhouse that could handle "tonnage at speed" over the entire line.

The Breaking Point of Existing Power

To understand why the Challenger had to be built one must look at where UP's existing fleet hit its absolute breaking point. The 9000-class 4-12-2 locomotives were masterful sprinters on flat territory, but they simply could not cross into the mountain divisions. Their massive, thirty-foot rigid wheelbase risked ripping up the rails or derailing entirely on the tight, twisting curves of the Oregon Short Line and the Wasatch Range, meaning these powerful engines were geographically trapped on the Nebraska plains.

Conversely, the 2-8-8-0 compound Mallets possessed the articulated frames necessary to snake through mountain curves, but their mechanical design actively fought against speed. Because they recycled steam from smaller high-pressure cylinders into massive low-pressure front cylinders, they choked at speeds above twenty-five miles per hour. Attempting to push them any faster caused the front cylinders to starve for steam, creating immense backpressure and violent mechanical pounding that could literally tear the heavy machinery apart.

1 4-6-6-4 "Challenger" Locomotives: Photos, History, Survivors

This stark divide created a severe operational bottleneck across the system. A fast freight train would rocket across the prairies behind a 4-12-2, only to grind to a forced halt at the engine terminal right before the mountains. There, the train had to be broken up into smaller, lighter sections or delayed for a costly locomotive swap, trading the fast sprinter for a sluggish mountain climber. This mechanical disconnect caused yards to plug up with idle freight and shattered any hopes of maintaining a truly rapid, competitive transcontinental schedule.

A New Class of Locomotive

The 4-6-6-4 Challenger developed in partnership with the ALCo solved the speed versus power paradox through three critical innovations. First, the design utilized simple expansion articulation. Instead of recycling steam through low-pressure cylinders as older compound Mallets did, the Challenger delivered fresh, high-pressure superheated steam directly from its high-capacity boiler to all four cylinders simultaneously. This approach provided massive tractive effort without restricting steam flow, allowing both the front and rear engine sets to work in perfect harmony at high speeds.

Second, the design incorporated massive 69-inch driving wheels. Traditional articulated locomotives used small drivers typically measuring 55 to 63 inches to maximize raw pulling power at slow speeds. By utilizing larger 69-inch drivers, the Challenger covered more track per piston stroke, drastically reducing backpressure and minimizing wear on the reciprocating machinery during fast runs.

Finally, the engineering team incorporated advanced lubrication systems and Timken roller bearings across the axles. By eliminating traditional friction bearings, the Challenger practically eradicated overheated axle journals, vastly improving operational reliability and allowing the locomotives to run continuously across multiple divisions with minimal maintenance.

The practical consequences were revolutionary for the railroad. The Challenger successfully doubled the speed of heavy mountain freight, elevating sluggish drag speeds from 25 mph to a sustained 50 mph or higher, all while remaining flexible enough to bend smoothly through tight mountain curves.[1]

Functional Design and Lasting Legacy

Every physical component of the 4-6-6-4 layout was structured to balance speed, track flexibility, and high-capacity steam power. Up front, a four-wheel lead truck acted as a high-speed steering mechanism to guide the locomotive smoothly into mountain curves. Behind it, the split six-coupled driver sets gave the engine the massive pulling power of twelve driving wheels while maintaining the shorter, flexible wheelbase of two smaller engines working in tandem. Beneath the cab, a heavy four-wheel trailing truck supported a massive firebox with up to 132 square feet of grate area, generating the high-pressure steam needed to feed four hungry cylinders operating at 280 psi. This versatile architecture made the Challenger equally adept at hauling heavy manifest freight or speeding premier passenger trains across the West.

The structural success of the Challenger completely rewrote the rulebook for heavy steam power across North America. Before its arrival, articulated locomotives were largely dismissed as sluggish drag engines meant solely for mountain grinding. The Challenger proved that an articulated engine could be an agile, high-speed, mainline thoroughbred. When Union Pacific required an even larger engine to cross the Wasatch Range unassisted, Otto Jabelmann did not design a new locomotive from scratch. He simply expanded the proven Challenger platform by adding two extra driving axles and a larger boiler, creating the legendary 4-8-8-4 Big Boy. By transforming simple expansion articulation into a high-speed standard, the Challenger left an indelible mark on modern railroading history.

1 Union Pacific Challenger - Wikipedia