



Rail

HATCH



Keeping Goods Moving



In today's world of global trade, integrated economies, markets, and *just-in-time* logistics, the role of railroads moving goods is more crucial than ever. Our infrastructure team is uniquely positioned to assist clients, as owners or shippers, with all rail-related needs. Hatch has designed and managed some of the most prominent rail & transit projects around the world.

Our engineering capability extends beyond the design and planning process incorporating global expertise in understanding the entire rail system including performance requirements. Our Rail Team knowledge can be used to identify and implement improvements in rail operations and maintenance practices tailored to our Clients. A selection of our successful projects include complete track and right of way design including subgrade, bridges and structures, retaining walls, and signals & communications. We lead our clients through procurement, then manage construction and remain in support for the long term with maintenance of the facilities. Additionally, we provide expertise in rolling stock design and maintenance, maintenance facilities, intermodal and bulk commodity loading/unloading infrastructure.

Proven performance on key projects demonstrates our depth of rail engineering experience and breadth of expertise. Whether preparing feasibility studies, specifying or selecting rolling stock, designing rail operations and infrastructure, planning, or overseeing construction, our skilled engineers will find efficient and innovative solutions to meet your needs.

With specialized railway staff who have wide-ranging experience in the freight transportation sector, and with offices throughout North America, Australia, and South Africa, we have a global presence in infrastructure, mining, and energy projects around the world.

Our Rail Expertise

Our staff has experience in all facets of rail engineering, design and operations. Our skilled team can simulate rail operations and product flows from origin to destination helping you identify the infrastructure that best fits your individual need. Our key people have experience as managers, operators, and maintainers on Class I railroads, so our design expertise is backed by practical, hands-on knowledge.

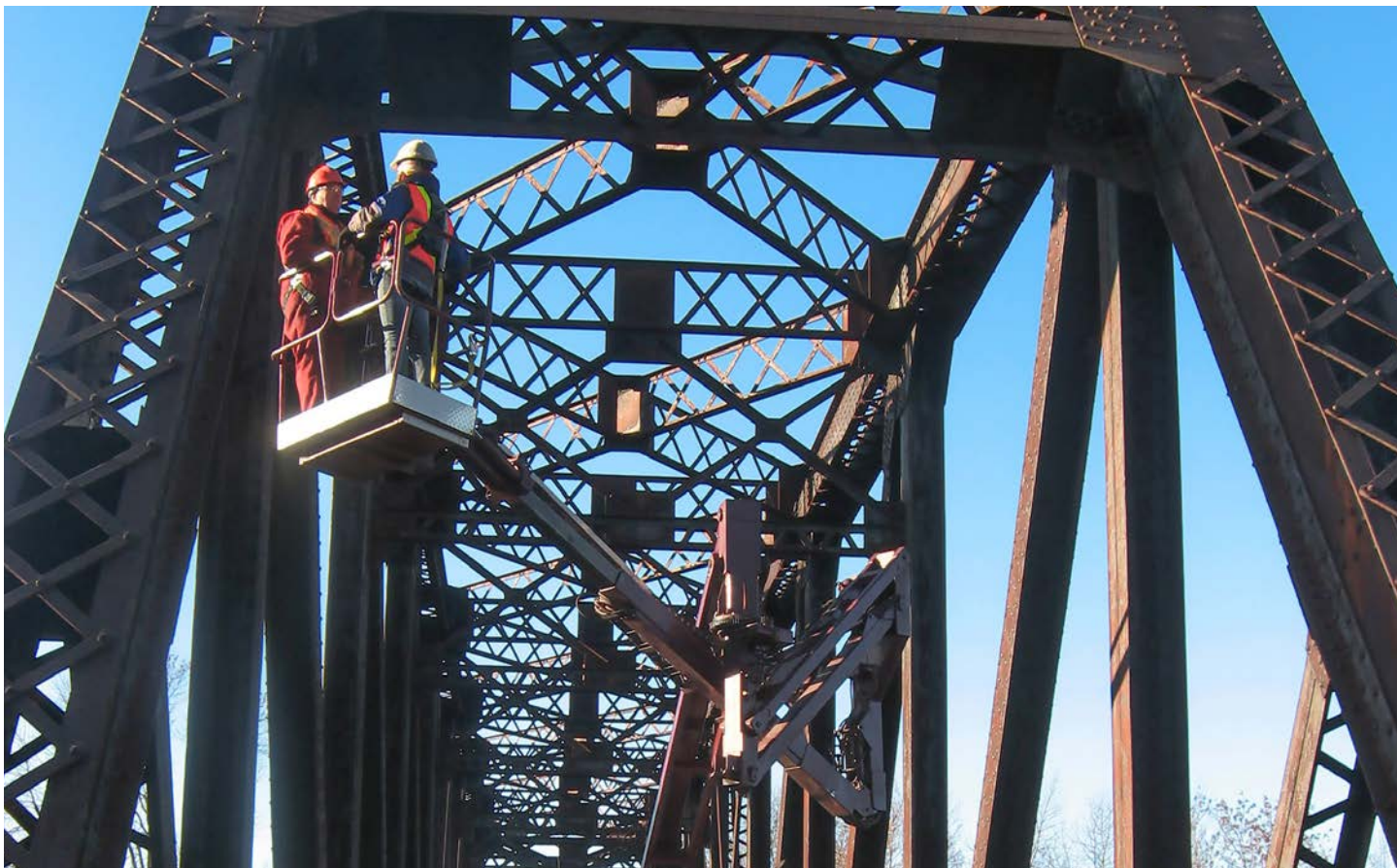
We add value to design and engineering processes because we understand the way in which design details affect construction, operations, and maintenance activities.

Hatch is also experienced with all methods of project delivery, including Alliance Contracts, Early Contractor Involvement, Public-Private-Partnerships (PPP) and Design Builds and can work with you and guide you to find the best solution for your business.

Our rail expertise covers the following areas:

- Railroad mainline, multi-track and siding design and construction
- Rail bridges, tunnels, and structures
- Rail systems – signals, communications, traction power, and wayside systems
- Industrial yards and private sidings
- Rail marshalling yards and intermodal terminals
- Rail operations including dispatching, crewing, and mechanical procedures
- Rail car maintenance, repair and storage facilities
- Capacity planning, analysis, simulation and optimization
- Grade separations and crossings
- Motive power and rolling stock
- Track maintenance planning and procedures including Asset Management
- Digital Twin





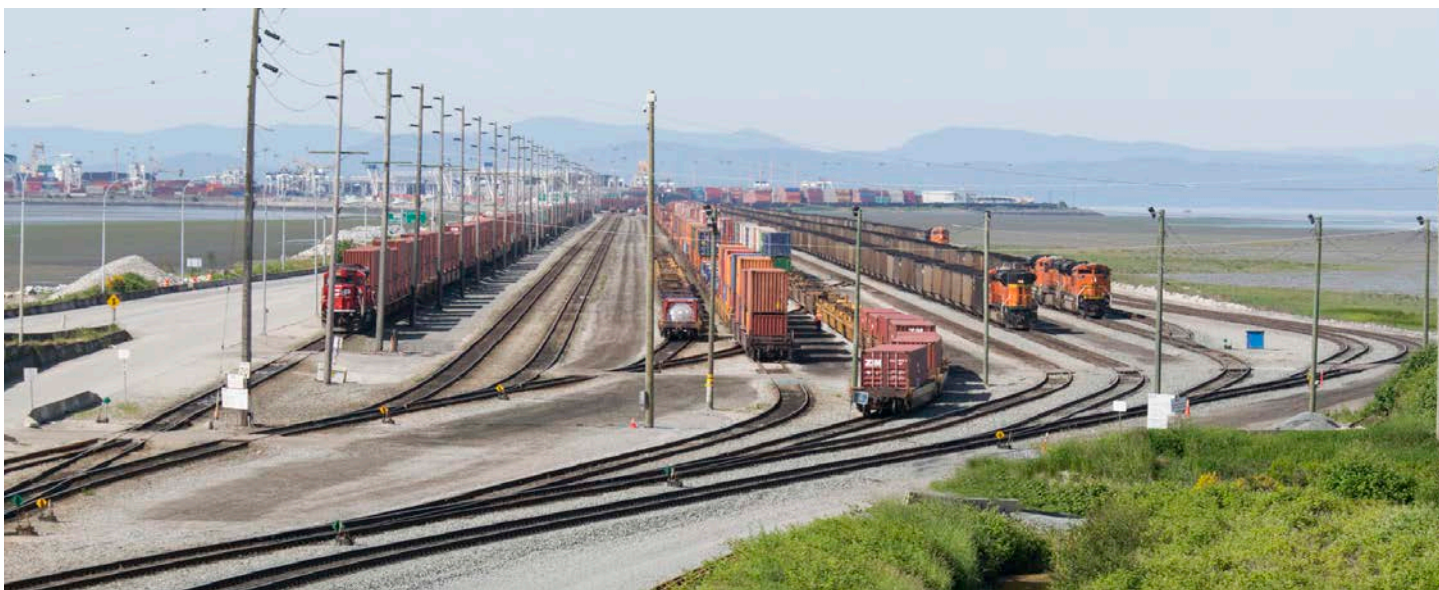
Our Rail Services

With 1000 rail & transit technical staff, our professionals have unmatched experience in engineering design and construction management on railroad projects, including related infrastructure for ports and mining operations.

Our team includes more than 100 professionals who have previous experience working for Class I railroads, international and regional railroads.

We have the capability and experienced team to carry out these rail engineering and design services:

- Route selection, alignment, and optimization
- Track design – conceptual, preliminary, and detailed
- Signals and communications design
- Scoping and feasibility studies
- Rail logistics, simulation, operations, and train service design
- Motive power, rolling stock specifications, and procurement
- Rail crossing assessments and rail safety reviews
- Track inspections, assessments, audits, and rehabilitation
- Project, program, and construction management
- Due diligence and value engineering
- Discrete simulation and modeling
- Full Owner's Engineer services



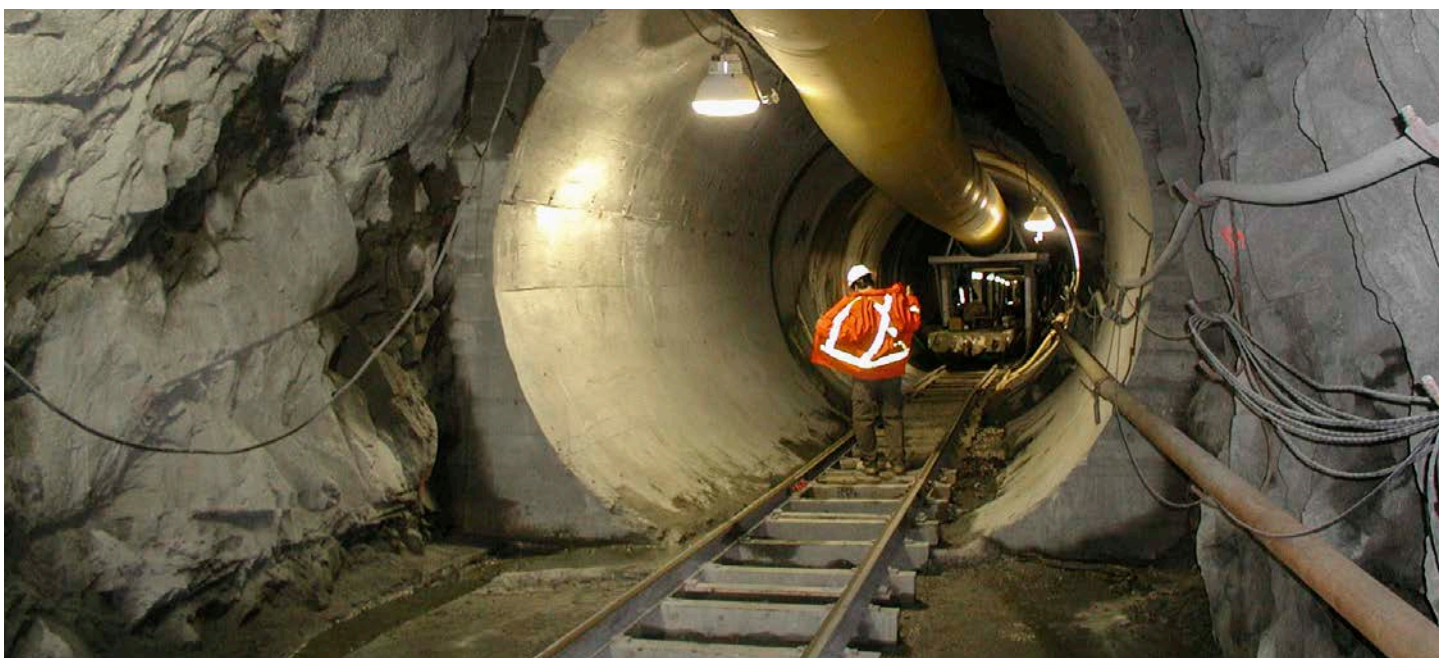
Our Key Competencies and Projects:

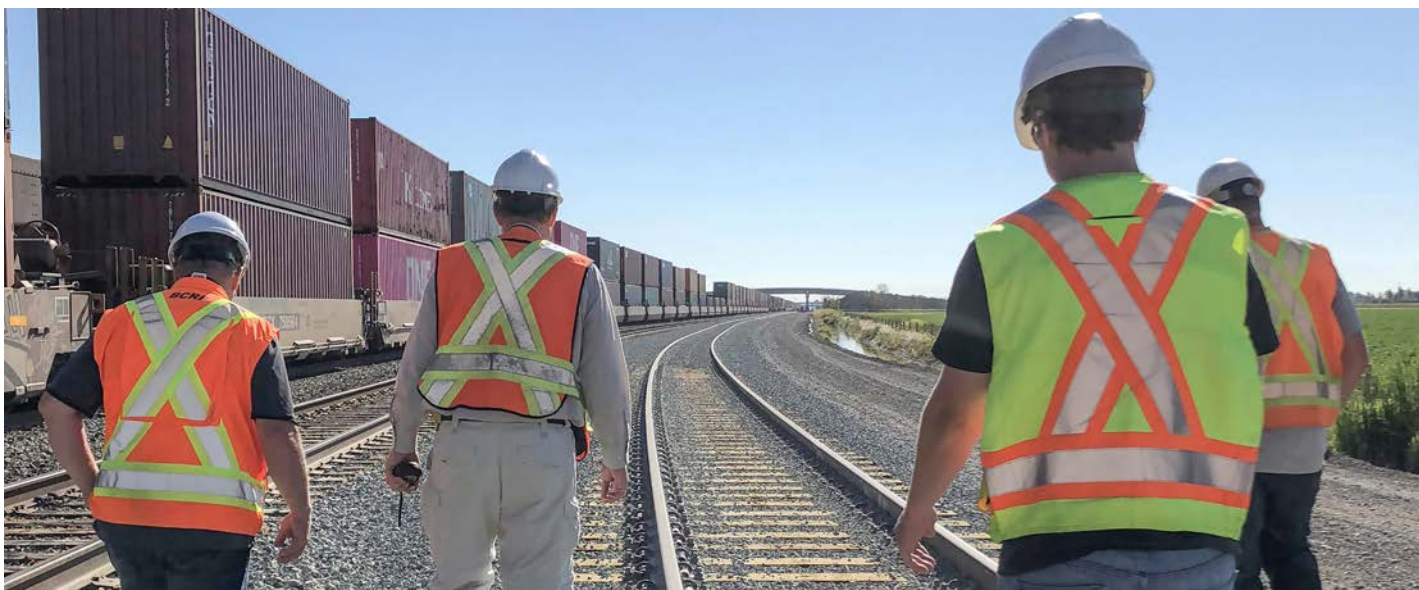
Track Design

We have experience with designing all aspects of rail track infrastructure, providing well-rounded teams to meet challenges and deliver solutions. Whether a private siding, yard track, terminal, loop track, or mainline tracks or sidings, our engineers are completely familiar with current design standards and know how to balance safety, cost, and functionality for our clients.

Rail Bridges, Tunnels, and Structures

Our staff have a comprehensive understanding of the key design requirements of bridges, grade separation, culverts, tunnels, and buildings for railways, and how they interface with other infrastructure elements such as track, signals, roads, or waterways.





Rail Operations and Maintenance

Our team of operations and maintenance experts are experienced in the development and assessment of train operating procedures and operational readiness plans. They are skilled at train service design and optimization and have practical experience related to railyards, mainline operations, and dispatching.

We can inspect, assess and recommend maintenance requirements for rail infrastructure for our clients. Our operations and maintenance expertise contributes to bringing innovation to rail design and construction.

Owner's Engineer

The strength and depth of our capabilities is reflected in the fact that Hatch has long-term service agreements with major freight railways in North America, Australia, and South Africa. Through Owner's Engineer or Master Service Agreements, we provide our clients with a full suite of rail infrastructure engineering services and expertise.

This one-stop shopping assures our clients we can integrate all elements of their rail engineering and operating objectives.





General Freight and Heavy Haul

General freight rail corridors transport a multitude of commodities in different train configurations, running at different speeds, in a time- and cost-efficient manner. Our clients have reaped the benefits of integrated solutions that we have developed in conjunction with operating staff and management teams.

Our rail capability was founded on heavy haul rail design. We understand that the key to success is maximizing throughput and profit while minimizing cost and optimizing operations at mines, terminals, and main tracks.

Integrated Value-Added Services

The planning, designing, and construction of efficient railroads requires more than technical engineering know-how; it involves a varied skill set that contributes to ensuring innovative and cost-effective solutions. We offer *Integrated Value-Added Services* to our clients, including strategic route planning and rail systems capacity analysis to identify potential bottlenecks; modeling of integrated train service, additional infrastructure, and associated throughput capacity; pit to port dynamic simulations; rolling stock assessment needs and procurement; environmental planning and permitting, and overall asset management.





Signals and Train Control

Our signal design professionals develop customized signal engineering standards, maintenance and test programs, safety assurance analyses, block design, evaluations through computer analysis and simulation, maintenance audits for regulatory compliance and implementation of GIS and asset management systems. We provide expertise to our clients in vital and non-vital circuit design; CBTC systems design; PTC systems design; centralized traffic control and ABS signaling; highway-rail grade crossing warning systems; and control & dispatch system design.

Telecommunications

Our skills in telecommunications and control systems for railroad and transit operations are matched by our expertise in real time customer information systems. This covers every aspect from the design of control centers to technical audits for public address systems and information display systems. Our continual focus on efficiency and profitability put revenue protection high on the agenda. We have the expertise to meet our clients' requirements for all rail and transit telecommunications systems covering voice, video, and data.





Vehicle Engineering

Our project history includes completing a journey of 100 years transporting generations via generations of vehicles throughout United States. We have helped procure and overhaul more than 26,000 rail vehicles. We are proud to staff the largest group of specialty rail vehicle engineers in the country. Our attention to detail is paramount in ensuring regulatory compliance and providing deliverables tailored to our clients' operational needs.

Systems Engineering

Our INCOSE-certified professionals offer clients full systems engineering services for all rail systems solutions. These services are based on the tenets of the V-Model and industry-accepted organizations, such as the Institute of Electrical and Electronic Engineers (IEEE)1220, including client and supplier-level requirements derivation; refinement and management; and client and supplier-level requirements verification and validation.





Traction Power / Power Rail and OCS

We undertake electrification feasibility studies, system load flow analysis, detailed designs, various specialty studies, and state of good repair assessments of both AC and DC traction power systems. We have experts to assist with utility grid interfacing; power distribution; feeding arrangements; sectionalizing; grounding and bonding; overhead contact systems (trolley and catenary); 3rd and 4th rail power distribution; fault analysis; electromagnetic interference (EMI); and corrosion and stray current control. We also have the experience and capability to develop energy storage systems (flywheel, capacitors or battery) for use with regenerative braking, microgrids, utility feedback systems, and have developed our own proprietary predictive power optimization technology for overall minimization of your lifecycle costs.

Revenue Systems

Our team is currently leading Philadelphia, Washington DC, Buffalo, Edmonton, and others with successful implementations of new payment systems. We provide extraordinary depth and problem-solving capabilities supporting visioning, improving the customer experience with timely fare products and policies, design, procurement support, legacy integration, equipment testing and installation, and system acceptance. Modern payment systems offer a rich, real-time supply of quality data which can transform operations and service scheduling to implement optimized, customer-focused strategies. Our specialty services range from Title VI analysis, fare policy studies, revenue development, current-state evaluations, regional integration, and technology plans to comprehensive program management.





Zero-Emissions

As a market-leader in transit vehicle and electrical systems design with nearly a century of experience, we bring extensive expertise in the design, engineering, and development of electric vehicles and their supporting wayside systems for various modes and applications. We leverage our extensive experience in vehicle design and system electrification to help clients develop zero-emission vehicle performance specifications, design charging infrastructure, and adapt existing facilities and support systems to incorporate zero-emissions infrastructure. Our staff's expertise extends across the entire project lifecycle –planning, design, specifications, procurement support, design review, oversight

of production, construction, installation, testing and commissioning, and ongoing technical support. We offer accurate and detailed simulation of the performance of electrified transit and other infrastructure. Our software suite allows comprehensive modeling of traditional electric traction networks, from utility feeds down to the performance of individual vehicles, and we have expanded our capabilities to calculate the energy demands of battery-electric and fuel cell operations. We have the capacity to estimate the changes in electrical energy demand as our clients' fleets transition from fossil fuels to electric propulsion, and the progressive increase in utility usage and needed charger capacity. We can also design energy storage solutions to improve system resilience and reliability.



+ About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly. We respond quickly with solutions that are smarter, more efficient and innovative. We draw upon our 9,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

Paul Wilson

Director of Rail - United States of America | Infrastructure
Hatch
601 S. Figueroa Street, Suite 4575
Los Angeles, California 90017
United States
T: +1 213 814 3653 | C: +1 661 373 7067
E: paul.wilson@hatch.com

Jason Barton

Regional Manager, Rail | Infrastructure
Hatch
600 Parker Square, Suite 225
Dallas, Texas 75028
United States
T: +1 972 457 9068 | C: +1 214 909 9442
E: bartonj@hatch.com

Sylvain Laporte

Director of Rail - Eastern Canada | Infrastructure
Hatch
5 Place Ville Marie, Bureau 1400
Montréal, Quebec H3B 2G2
Canada
T: +1 438 266 0770
E: sylvain.laporte@hatch.com

Barry Singer

Global Director, Rail | Infrastructure
Hatch
1066 West Hastings Street, Suite 400
Vancouver, British Columbia V6E 3X2
Canada
T: +1 604 639 1036 | C: +1 778 886 0036
E: barry.singer@hatch.com

Jonathan McDonald

Global Director, Rail Systems | Infrastructure
Hatch
1999 Harrison Street, Suite 620
Oakland, California 94612
United States
T: +1 510 390 8035 | C: +1 415 370 7472
E: jonathan.mcdonald@hatch.com

Andrew Middleton

Director of Rail Bridges | Infrastructure
Hatch
5 Place Ville Marie, Bureau 1400
Montréal, Quebec H3B 2G2
Canada
T: +1 438 266 0820
E: andrew.middleton@hatch.com

Victor Czarnocki

Director of Rail - Western Canada | Infrastructure
Hatch
1066 West Hastings Street, Suite 400
Vancouver, British Columbia V6E 3X2
Canada
T: +1 905 403 4437 | C: +1 604 340 3580
E: victor.czarnocki@hatch.com

Eric Cone

Global Director, Transit | Infrastructure
Hatch
Sheridan Science & Technology Park
2800 Speakman Drive
Mississauga, Ontario L5K 2R7
Canada
T: +1 905 403 3835
E: eric.cone@hatch.com