

50 Street Widening and Grade Separation of CPKC Railway Overpass Construction in an Urban Environment - Challenges with Utility Conflicts, Relocations, and Coordination

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Abstract

50 Street is a key north/south arterial road in Edmonton that functions as both a major goods movement and commuter corridor. The existing at-grade Canadian Pacific Kansas City Limited (CPKC) railway crossing presented a major bottleneck to traffic movements, with an average of 25 daily back-and-forth train movements resulting in an average delay of 4 minutes (with some delays as long as 15 minutes) for travelers.

The 50 Street widening and grade separation project is constructing two (2) new overpass structures to eliminate the at-grade crossing and widening 50 Street to three (3) travel lanes in each direction within the project limits. Due to the urban location, the project faced several unique challenges including space and land constraints, traffic management, and numerous existing overhead and underground utilities.

Existing utilities presented a particularly significant risk and challenge to the project, both in terms of schedule and cost. The existing utilities included gas, water, telecommunications, and electricity owned by ten (10) different entities. There were also five (5) oil and gas transmission pipelines and one (1) power transmission line to deal with. The conflicting utilities and two (2) of the transmission facilities needed to be abandoned, removed, and/or relocated while maintaining existing traffic capacity with two lanes of traffic in each direction to minimize disruptions.

Several strategies were implemented to mitigate these risks and keep the project on track, including the execution of an “Early Works” Contract where conflicting utilities were addressed prior to the start of main construction of the overpasses. A combination of different construction methods including open trenching as well as trenchless installations (HDD) and targeted traffic closures and restrictions were utilized to minimize disruptions to traffic and nearby businesses.

Early and careful planning and utility coordination combined with the successful execution of the Early Works Contract resulted in most of the conflicting existing utilities and two (2) of the conflicting existing transmission facilities being relocated or removed prior to the start of construction of the overpasses, allowing the project to stay on schedule.

Project Background

50 Street is a critical arterial roadway within the city of Edmonton, providing essential access to adjacent developing industrial areas and functioning as a major north-south commuter and goods movement corridor. 50 Street was configured primarily as a four-lane roadway between 90 Avenue and the Whitemud Freeway, with localized widening to three lanes in high-volume segments and at select intersections to accommodate dedicated turning lanes.

The 50 Street widening and grade separation project is constructing two (2) new overpass structures (a northbound (NB) bridge and a southbound (SB) bridge) to eliminate the at-grade rail crossing as well as widening 50 Street to three (3) travel lanes in each direction from Sherwood Park Freeway to 90 Avenue. Within the project limits, 50 Street provides access to the Morris and Lambton Industrial areas as well as the residential neighbourhoods of Kenilworth and Ottewell. The location of the project within the City of Edmonton is shown in **Figure 1**, the overall project site plan is shown in **Figure 2**, the project limits are shown in **Figure 3**, and a conceptual rendering of the completed overpass structures is shown in **Figure 4**.



Figure 1: Project Location Within the City of Edmonton

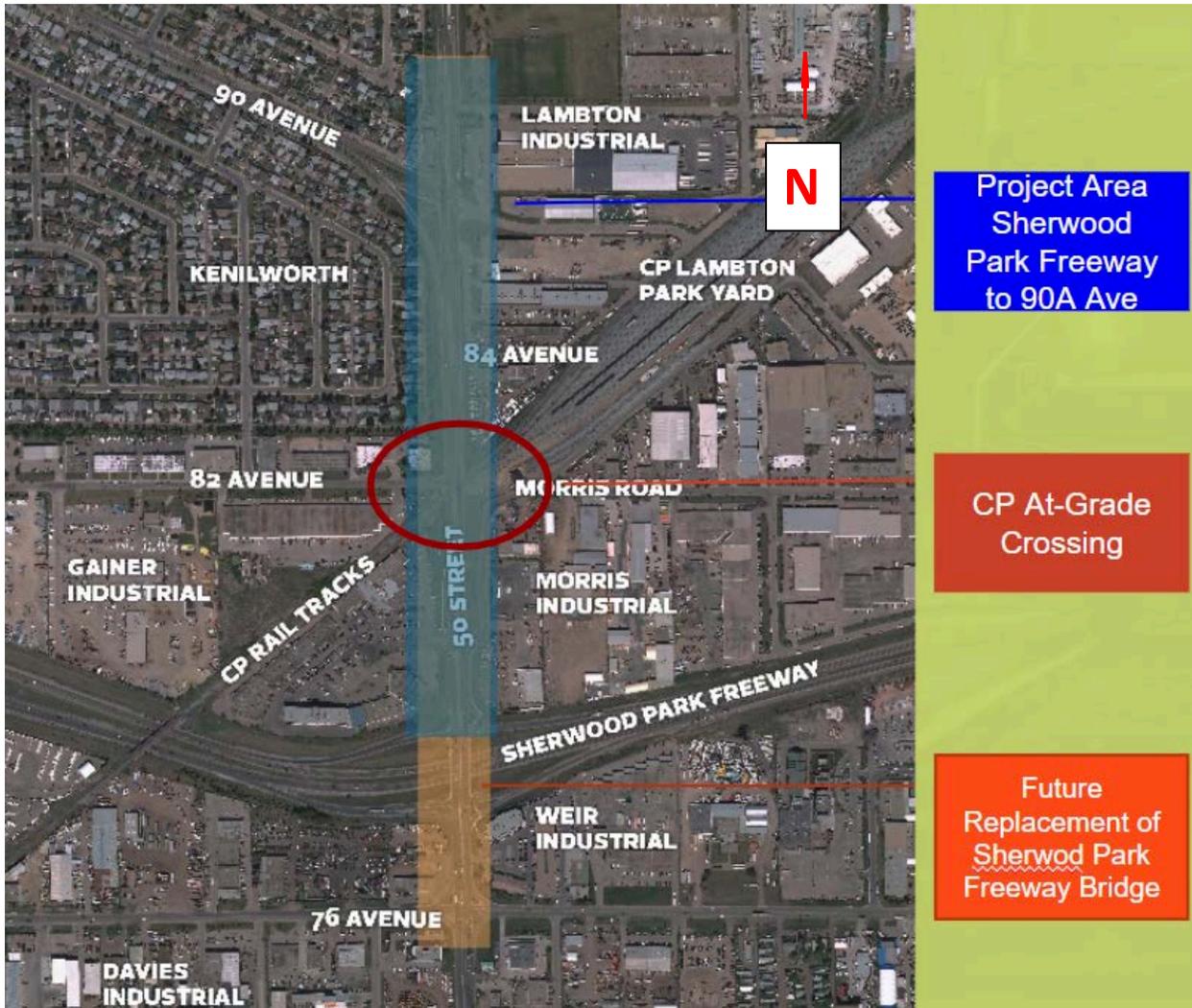


Figure 2: Project Site Plan

50 Street Widening and Grade Separation over CPKC Railway
Overpass Construction in an Urban Environment - Challenges with Utility Conflicts, Relocations, and Coordination



Figure 3: Project Limits



Figure 4: Overpass Concept Rendering

Just north of the Sherwood Park Freeway, CPKC Railway's Scotford Subdivision intersects 50 Street on an east-west alignment. Although only a single track crosses the roadway at this point, it diverges approximately five metres east of 50 Street into 20 tracks that form CPKC's Lambton Park Yard. The Lambton Park Yard is a significant node in the Western Canadian railway network, providing critical truck-to-rail transloading services that support Alberta's Industrial Heartland and provide significant contributions to the Province's economic growth.

Both 50 Street and the Lambton Park Yard are integral components of the municipal and provincial transportation and economic systems. However, the existing at-grade crossing presents a major operational constraint, resulting in frequent and prolonged delays for commuters, local businesses, and residents. On average, eight (8) full train movements occur across the intersection each day. In addition, approximately 25 daily shunting operations—back-and-forth train movements required to assemble trains—cause further disruption. These activities contribute to significant congestion for the estimated 35,000 vehicles that utilize the corridor daily, with average delays of approximately four (4) minutes per event and instances of blockages exceeding 15 minutes.

Initial conceptual planning for the widening of 50 Street and grade separation of the CPKC crossing between Sherwood Park Freeway and 90 Avenue (the Project) was completed in 2010. The concept study recommended the construction of a roadway underpass at the railway crossing. However, further technical assessments identified significant challenges associated with the underpass option. Subsequently, an overpass structure was determined to be the more feasible option and would also provide superior operational benefits.

Ultimately, the project secured funding through contributions from both the provincial and federal government, allowing it to advance toward implementation.

The Construction Consultant General Contractor (CCGC) was brought on partway through the project to be involved in the construction planning and strategy development.

Utility Relocation Challenges and Risks

While often less visible to the public, utility relocations and/or removals can pose some of the most significant challenges to project delivery, contributing substantial complexity to design, schedule coordination, and construction staging.

A project of this scale and political significance presented numerous challenges and constraints, with one of the most significant being the relocation or abandonment of utilities and transmission facilities that conflicted with the construction of the overpass structures. Along the 50 Street corridor, a substantial number of utilities and transmission installations required relocation either ahead of, or in coordination with, overpass construction activities. In total, 12 utilities needed to be relocated.

The 50 Street corridor within the project area is abutted by highly developed industrial parks and mature residential neighborhoods, hosting a dense network of existing utilities. The public right-of-way also served as a utility corridor for facilities that serviced other areas of the city. The existing utility network along the corridor — comprising of electricity, telecommunications, cable, streetlights, traffic signals, storm, sanitary and combined sewers, high pressure gas pipelines and natural gas services — had to be reviewed in detail to determine if utility conflicts existed. Each utility retained ownership of its

infrastructure and bore full or partial responsibility for the design, construction, cost, and ongoing maintenance of its relocated assets, depending on the type of agreement that is administered by City Council or the administration (the City). Furthermore, each utility company had to independently manage their own internal approvals, customer communications, and service continuity requirements (and, in some cases, external approvals from the Alberta Utilities Commission (AUC) or the Alberta Energy Regulator (AER)), making coordination particularly challenging. During the project construction and staging, services to existing residential, commercial, and industrial customers had to be maintained.

The utility relocation process required detailed coordination to balance the needs of multiple stakeholders, to integrate with the overall project staging, and to maintain critical service continuity.

Utility relocation is often an underestimated component of major infrastructure projects but can significantly impact both cost and schedule if not proactively managed. The project team faced several risks, including:

- **Third-Party Coordination Risks:** Each utility and transmission entity operated on independent timelines and resource availability, creating potential bottlenecks in sequencing relocations.
- **Schedule Delays:** Delays in utility design, permitting, material procurement, or construction had the potential to directly impact critical path activities for the overpass construction.
- **Access and Space Constraints:** The confined urban environment of the corridor limited options for temporary or permanent utility placements, necessitating innovative staging solutions.
- **Crossing Agreements and Regulatory Approvals:** Certain relocations, particularly those crossing railway property and the pipeline crossings, required negotiation of complex Crossing and Proximity agreements and some regulatory permits.

Proactive engagement strategies were critical to managing these risks. The City worked closely with utility providers through regular coordination meetings, early identification of conflicts, joint development of relocation designs, consensus on utility and pipeline abandonments, and incorporation of utility work into the overall construction staging plan. Additionally, interim measures such as temporary relocations and service diversions were employed to maintain project momentum while minimizing service interruptions.

Utility Relocation Process

Relocating utilities and transmission facilities are often some of the most challenging aspects of a construction project, and 50 Street was no exception. Managing the risks and potential delays required a dedicated team of utility experts, designers, and communications specialists to engage in regular meetings, progress tracking, follow-ups on action items, and scheduling workarounds. In total, the following ten (10) utility, transmission, or pipeline companies/departments had existing facilities in the project area:

- ATCO Gas and Pipelines Ltd. (gas distribution & high-pressure pipeline facilities)

- Bell Canada (telecommunications servicing & trunk line)
- City of Edmonton City Operations (street lighting & traffic signal facilities)
- EPCOR Distribution & Transmission (power distribution & transmission lines, & SCADA facilities)
- EPCOR Drainage (storm, sanitary, & combined sewers)
- EPCOR Water (water distribution lines & fire suppression facilities)
- Shaw Cablesystems Limited (telecommunication servicing)
- TELUS Communications Company (telecommunication servicing)
- Rogers Communications Canada Inc. (telecommunication servicing)
- Zayo Canada (telecommunication servicing)

The City holds franchise or Rights-of-Way Consent and Access agreements with nine of the utility and pipeline entities. The facilities owned and maintained by City Operations required coordination with that department. All the affected companies/departments had to remove, relocate, or abandon some of their infrastructure within the City's road right-of-way (ROW) to accommodate the new roadway and bridge construction.

At the outset of the project, a dedicated group of external utility experts was formed within the project team to manage the relocation process. All external utility/pipeline companies were formally notified by letter about the project scope and the anticipated timelines for potential relocations for when their work needed to be completed. Identifying utility conflicts and planning for relocations started early during the pre-construction phase, with specific team members assigned to lead coordination efforts.

Some key strategies we used to manage utility relocations are highlighted below:

a) Planning and Pre-Coordination

Early planning with utility companies made a big difference. It allowed for both utility and roadway design adjustments before the physical utility relocations started, making sure that utility work would not slow down construction later.

Pre-planning activities also involved developing detailed CADD drawings, a Utility Work Responsibility Matrix, a Subsurface Utility Engineering plan, a Composite Utility Plan, and a Utility Conflict Matrix. These documents identified:

- Public and private utilities requiring relocation or mitigation
- Ownership and responsible parties
- Contact information and permitting requirements
- Existing utility locations and potential conflicts
- Proposed utility alignments for the required relocations
- Abandonment or removal requirements
- Required sequencing of the utility relocations, removals, and abandonments

The Composite Utility Plan was developed early in the pre-construction phase. This plan and the utility coordination work set out goals, strategies, and milestones, serving as a guide to measure progress, prioritize resources, and resolve conflicts as the project advanced.

Responsibilities, actions, and actual progress were tracked relative to the defined scope, design, cost, permitting, and construction activities.

b) Early Identification of Utility Conflicts

Early and proactive identification of utility locations and conflicts was a cornerstone of the relocation process. Dedicated utility coordination staff were assigned early in the project and remained consistent throughout, allowing strong working relationships to form with utility company representatives.

Utility impacts were carefully documented, updated regularly, and tracked through detailed utility maps and matrices, providing real-time visibility into potential conflicts.

c) Relocating Utilities into Joint Alignments

Where feasible, relocated utilities were grouped into joint trench alignments to minimize the number of individual utility crossings of the railway right-of-way and in road right-of-way alignments in other areas of the project. Shared conduit banks were utilized whenever technically possible (and with the concurrence of the affected utility companies) to reduce space requirements and facilitate maintenance.

Early CCGC involvement during the pre-construction phase also allowed for valuable input from the project's prime Contractor on the proposed utility alignments, removals, and abandonments, helping refine project designs and staging to minimize impacts on utility construction and roadway/bridge construction sequencing and other critical activities.

d) Coordination with CPKC

CPKC was a key aspect of this project, as they served as both a major stakeholder and a funding partner. Engagement with CPKC began early in the project to address the relocation of critical utilities that intersected with CPKC railway lines. These utilities included both underground and overhead lines, as well as the relocation of signal arms for the temporary detour road connecting Morris Road and Plaza 50. The design and installation of all railway crossing infrastructure, including crossing arms and signals, was the responsibility of CPKC, and the Early Works contractor coordinated final tie-ins to ensure operational readiness of the detour road.

All utility crossings—whether overhead or underground—had to comply with CPKC's design specifications, relevant statutes, geotechnical protocols, operational rules, and track monitoring guidelines. Where possible, utilities and power transmission facilities were relocated outside the railway corridor. However, for those utility facilities that needed to cross beneath the track, such as water mains and telecommunication lines, the design had to incorporate CPKC's stringent safety and structural requirements. These underground crossings were required to be installed in steel casing pipes with a minimum wall thickness, designed to withstand live train loads and potential ground settlement over time.

In addition, overhead utility crossings needed to maintain a minimum clearance of 8.3 metres (27 feet) above the top of the railway. High-voltage power lines required additional clearance, and all power poles had to be positioned at least 15.24 metres (50 feet) away from the centerline of the running tracks. For power lines operating at 120 volts or more, steel or reinforced conduits were required, designed to meet

both loading and safety standards. The aerial power lines also required the safe Limits of Approach (at least 7 metres) to be met while the northbound bridge was being constructed.

Utility railway crossing approvals can be complex and are only granted when the crossing is essential to maintaining critical connections across the railway corridor. The process often takes up to a year from initial discussions to implementation. As such, early and continuous collaboration with CPKC was vital to ensure design compliance and timely delivery of the project.

To help streamline coordination and meet CPKC's strict requirements, the project team assigned a dedicated staff member with direct experience working with CPKC. This individual worked closely with utility companies to review their crossing applications before submission to CPKC. This proactive approach helped identify and resolve missing or incomplete information early in the process, which in turn expedited the review and approval timelines.

e) Coordination with Groups of Utility Stakeholders

Utility stakeholders with shared interests were organized into functional working groups, such as:

- EPCOR Distribution & Transmission
- EPCOR Water and Drainage
- ATCO Gas and Pipelines
- Telecommunications (Rogers, Shaw, Bell, TELUS, Zayo)

Recurring coordination meetings (monthly or bi-weekly, as needed) were held to address ongoing issues, resolve conflicts, and ensure coordination and cooperation between different utility providers.

f) Schedule Control and Maintaining Accountability

One of the main challenges was maintaining schedule accountability among utility and pipeline companies, many of whom were hesitant to provide formal schedules. To address this, the project team developed simplified, working schedules for each utility work order, capturing major milestones such as:

- Design
- Contract procurement
- Material procurement
- Construction activities

These individual schedules were linked to the **Master Project Schedule** and reviewed with utility representatives during each construction meeting. This proactive approach allowed the team to:

- Identify potential schedule delays early
- Develop and implement mitigation strategies
- Maintain overall project momentum

Through these dedicated and structured efforts, the utility relocation, removal and abandonment process—often one of the most complex and risk-prone aspects of infrastructure construction—was

successfully navigated, enabling the 50 Street project to proceed without major service disruptions or critical delays.

Utility Relocation:

Existing utilities within the 50 Street project corridor were primarily located along the east side of 50 Street north of the railway, as well as beneath the roadway. The corridor was divided into four main segments — two north and two south of the CPKC right-of-way, as shown in **Figure 5**.

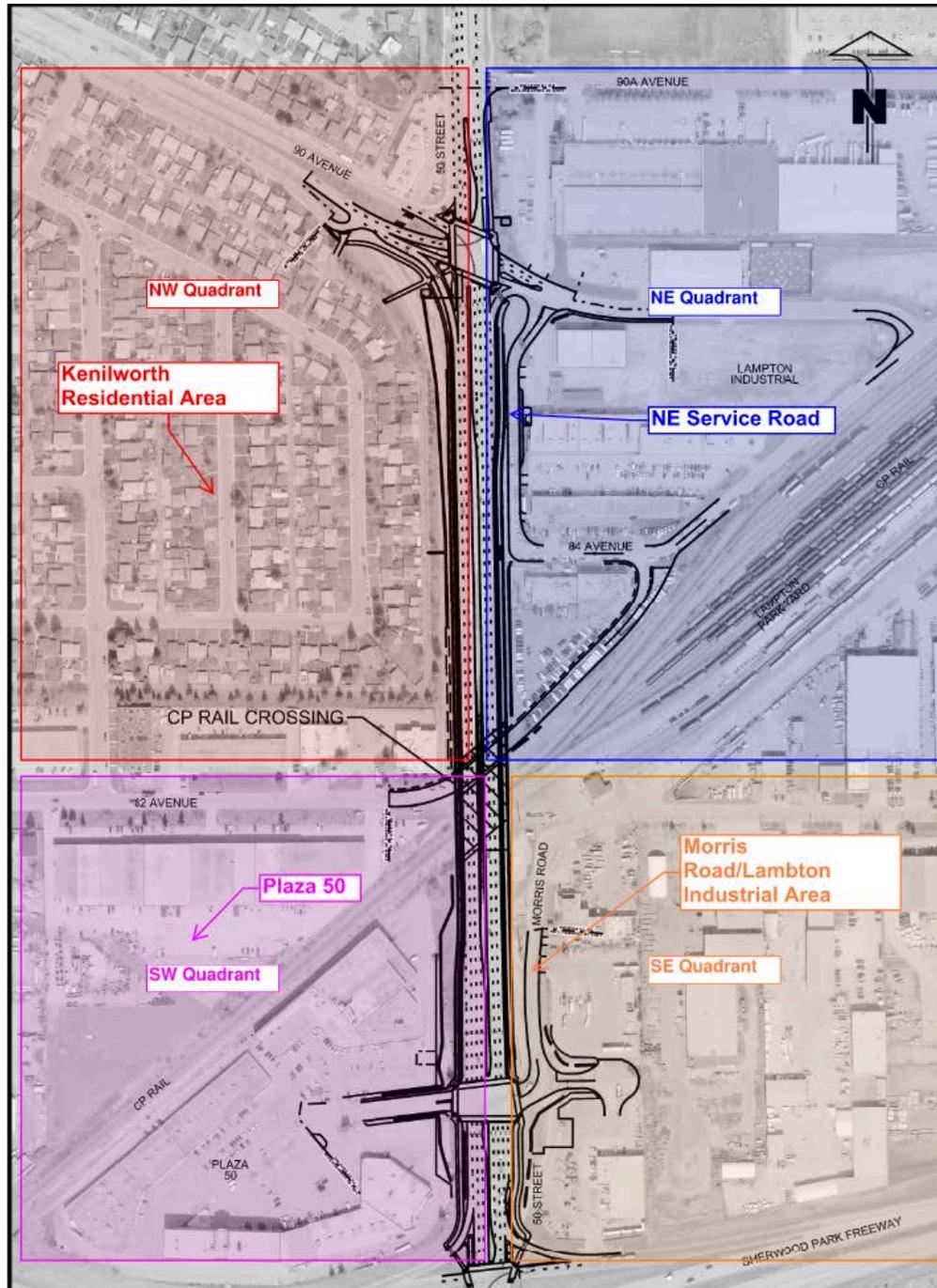


Figure 5: Project Area Quadrants

South of the railway, the southwest quadrant included the Plaza 50 commercial area, while the southeast quadrant included the Morris Industrial area. North of the tracks, the northeast quadrant aligned with the Northeast Service Road, and the northwest quadrant was bordered by the 90 Avenue roadway and the Kenilworth residential neighbourhood.

In total, the project team identified 203 utility conflicts that needed to be addressed before the overpass structures could be constructed. Resolving these conflicts was critical to enable the installation of the Mechanically Stabilized Earth (MSE) wall, a key structural component of the overpass. All utilities falling within the MSE wall footprint required relocation to accommodate its construction.

One of the primary challenges during utility relocation was the need to maintain two lanes of traffic in each direction throughout the construction period. To manage this, an early work package was initiated during the detailed design phase. This package included the construction of a temporary detour road and supporting drainage infrastructure. The detour enabled the westbound outer lanes to be shifted further west, allowing eastbound traffic to be redirected onto the westbound configuration, maintaining continuous traffic flow during construction.

Prior to the commencement of work on the northbound overpass structure, approximately 95% of all identified utilities were successfully relocated, removed, or abandoned, clearing the way for MSE wall construction and ensuring minimal disruption to project timelines.

The following utilities were relocated as part of this project:

a) EPCOR Transmission

EPCOR Distribution & Transmission Inc. (EPCOR), a public utility regulated by the AUC, owns and operates transmission facilities within Alberta. The company had existing high voltage power transmission infrastructure consisting of overhead lines strung on old wooden poles running along the west side of 50 Street throughout the project limits.

To accommodate the widening of 50 Street, including the construction of a temporary detour road, the relocation of these transmission assets was required. Under the terms of the franchise agreement between the City and EPCOR, the City is obligated to provide a minimum of 24 months' notice when requesting the relocation of transmission infrastructure for municipal purposes.

Following receipt of the City's notification regarding the 50 Street project, EPCOR initiated the design phase and began the regulatory approval process. In accordance with the agreement, EPCOR sought and obtained approval from the AUC, a process that typically requires a minimum lead time of one year. Upon receiving AUC consent, EPCOR coordinated with the City to coordinate the relocation and removal schedule with the overall project timeline. Additional approvals—including those from CPKC and the City's Utility Line Assignment (ULA) process—were also necessary, as these could impact the critical path for construction. The alignments of the existing and new EPCOR Transmission lines are shown in **Figure 6**.

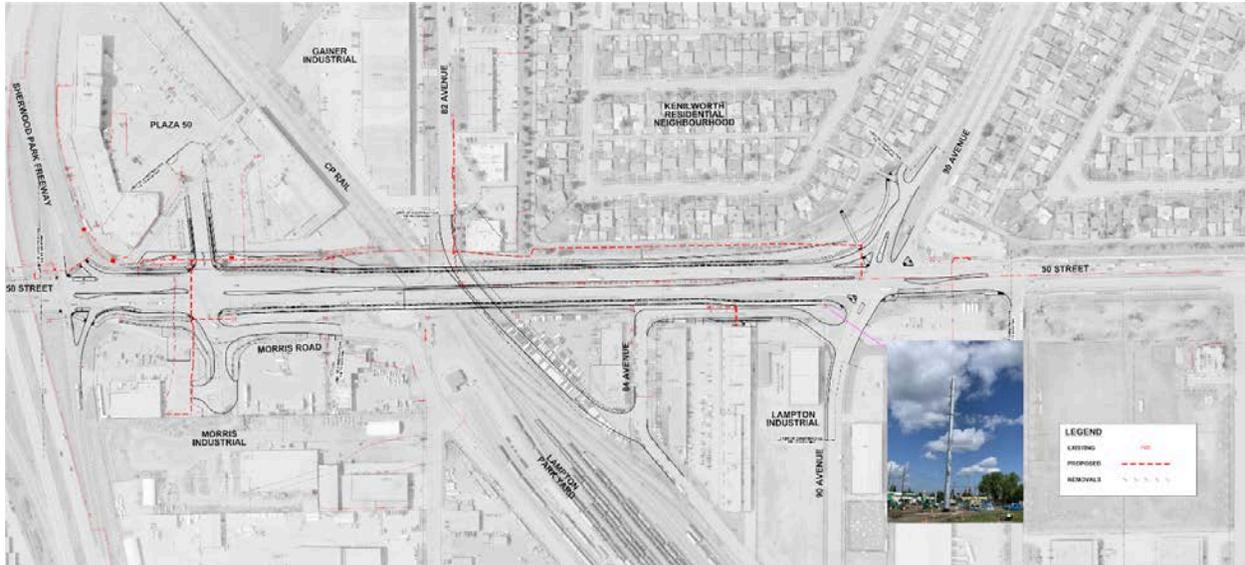


Figure 6: Existing and Proposed EPCOR Transmission and Distribution Alignments

Relocation of the transmission poles began in 2021 and was successfully completed by the summer of 2022, ensuring that transmission infrastructure was clear of the construction zone and allowing subsequent stages of the 50 Street project to proceed without delay.

b) EPCOR Distribution Inc. (EDI)

EDI's existing infrastructure included both underground and aerial electrical distribution systems, with a major duct line and vaults located within the center median or carriageway of the existing 50 Street roadway. This duct bank extended west and south, crossing beneath the CPKC right-of-way and intersecting the alignment of the planned detour road. The duct bank carried primary electrical feeders, fiber optic cables for EPCOR Transmission's SCADA capabilities, and Zayo's telecommunications fiber, making its relocation and partial abandonment complex and critical to the overall project schedule.

Changes in roadway grades and alignment directly impacted this infrastructure. To accommodate these modifications, the duct system was successfully partially relocated and abandoned through detailed design coordination and phased construction efforts. EDI worked closely with project stakeholders to ensure continuity of service and minimize disruption throughout the relocation process.

In addition to underground assets, overhead distribution lines located within the corridor required evaluation for potential conversion to underground systems. Where applicable, EDI coordinated with telecommunications providers to address third-party attachments and support the City's objective of reducing visual clutter and enhancing long-term utility accessibility.

Several EPCOR customers located on private property were also impacted by the roadway widening and bridge construction project. Some of these power distribution modifications fell outside the scope of the franchise agreement with the City and required separate funding approvals for customer-specific

connections. Through proactive engagement with City representatives and affected property owners, EDI successfully executed these adjustments in parallel with mainline relocation works. The alignments of the existing and new EPCOR Distribution lines are shown in **Figure 5**.

The successful completion of EDI's utility relocation/abandonment work was facilitated by early project involvement, consistent communication with municipal and regulatory stakeholders, and adherence to the franchise agreement, which mandates that EPCOR is responsible for its own relocation costs upon receiving reasonable notice. A lead time of up to one year proved essential in allowing for detailed design, regulatory permitting, budgeting, and stakeholder coordination.

Ultimately, EDI completed all necessary relocations within the required timelines, supporting the seamless progression of the 50 Street project.

c) EPCOR Water

EPCOR Water previously operated a 300mm asbestos cement (AC) distribution water main located within the center median of 50 Street, extending from 90 Avenue to south of the CPKC railway right-of-way. This water main included a protective casing under the railway crossing, with the water pipeline alignment continuing eastward towards Morris Road.

The broader water distribution network in the area also included mains located along the north side of 90 Avenue (east of 50 Street), as well as along 84 Avenue, 82 Avenue, Morris Road, and Sherwood Park Freeway. The network also involved numerous fire hydrants, isolation valves, and two active service connections.

To support new development and infrastructure improvements within the roadway corridor, upgrades and relocations were required to ensure system reliability, meet fire protection standards, and maintain serviceability to the surrounding areas. The scope included installation of new hydrants and associated infrastructure in accordance with current servicing and fire code requirements.

Relocation planning required careful consideration of site-specific constraints, particularly the presence of the Mechanically Stabilized Earth (MSE) retaining walls. Where the relocated waterline alignment encroached within 10 metres of an MSE wall, the installation of a secondary containment system—typically a steel casing—was required to satisfy engineering and safety criteria.

The key relocation activities included the following:

- Reconstruction of the waterline along Morris Road to accommodate elevation and grade changes.
- A new cased crossing beneath the CPKC railway on the west side of 50 Street, allowing reconnection to the existing main at 82 Avenue. To minimize surface disruption, meet railway permitting conditions, and adhere to construction requirements, the crossing under the CPKC railway was installed using the Horizontal Directional Drilling (HDD) method. This trenchless installation technique enabled precise alignment and minimized disturbance to both the railway

and surface infrastructure. Monitoring of the track alignments (both vertically and horizontally) was required by CPKC for this work.

- A new waterline crossing 50 street at the 90th Avenue intersection to connect the new water line within the Northeast service road south of 90th Avenue.

These relocations and upgrades were essential to accommodate planned transportation infrastructure improvements, while preserving the integrity and continuity of the municipal water distribution system. The alignments of the existing and new EPCOR Water lines are shown in **Figure 7**.

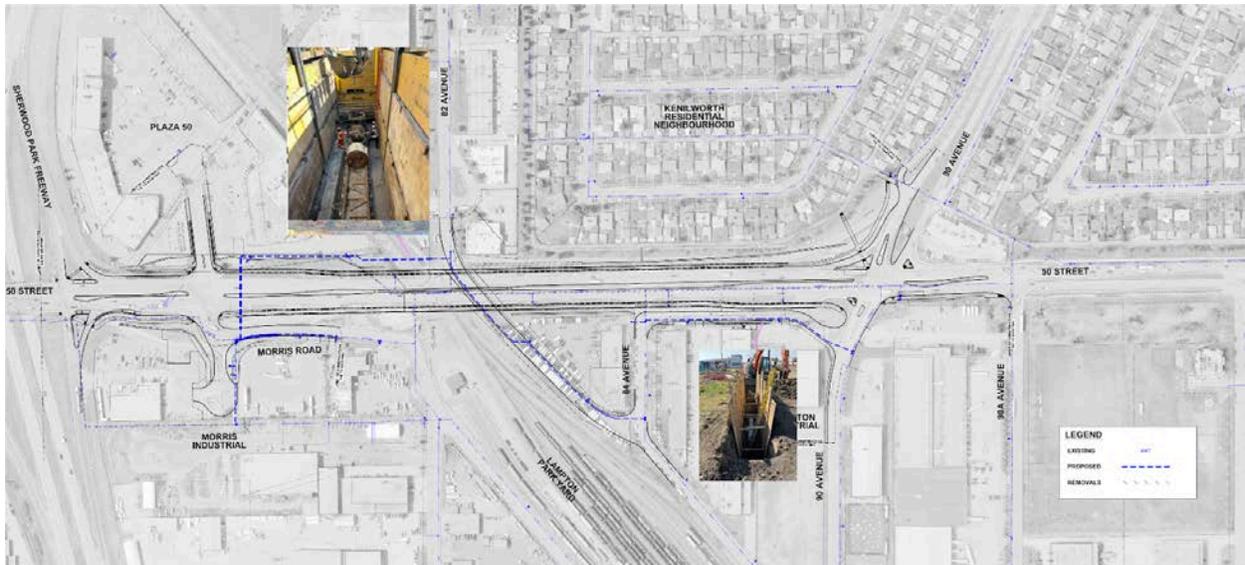


Figure 7: Existing and Proposed EPCOR Water Alignments

d) ATCO Pipelines

ATCO Pipelines operates two high-pressure (HP) pipelines—a 60mm and a 219mm line—located south of 82 Avenue and 50 Street in one of the oldest pipeline corridors in Western Canada. These pipelines conflicted with the proposed overpass construction and the new elevated access and turnaround for the Plaza 50 lands. The new roadway profile of 50 Street did not affect the 2 pipelines that cross 50 Street, but the new access and turnaround did, requiring engineering and safety reviews by ATCO and mitigation work in that area.

Additionally, an 203mm (8-inch) HP pipeline which crossed private property that the City acquired for the project and the 50 Street and 82 Avenue road rights-of-way were in direct conflict with the construction activities related to the NB structure piling operations and the ultimate realignment of 82 Avenue under the new bridge structures. As a result of these implications, portions of this pipeline were decommissioned and then permanently removed using the open-cut method.

e) ATCO Gas

ATCO Gas infrastructure was widely distributed across the project limits and was notably affected by the construction of the new overpasses and the widening of 50 Street. A 219mm intermediate pressure (IP)

main located north of 82 Avenue, which crossed 50 Street, was directly impacted by the CPKC railway grade separation and the proposed retaining walls. Additionally, a 114mm medium pressure (MP) main running along the west side of 50 Street—from south of 82 Avenue to Morris Road—and extending east across 50 Street, was also affected by the construction of the detour road and related infrastructure.

The sequencing of ATCO's relocation work was critical to maintaining continuous gas service to the affected businesses (especially during the winter months) and ensuring construction could proceed without delay. New gas mains had to be installed and activated before the existing mains could be safely decommissioned. A key component of this work included the installation of a new gas main along Morris Road and in Plaza 50. Another new line was installed within the Northeast Service Road to ensure uninterrupted gas supply to local businesses within the area.

The alignments of the existing and new ATCO Gas lines are shown in **Figure 8**.



Figure 8: Existing and Proposed ATCO Gas Alignments

f) Telecommunications

A total of five (5) telecommunications providers operate within the project area: TELUS, Shaw, Zayo, Bell, and Rogers. During the utility coordination and conflict assessment phase, it was determined that infrastructure belonging to four (4) of these providers conflicted with the proposed construction footprint and required relocation. The affected assets included underground fiber optic lines and associated vaults and telecommunication cabinets, and overhead telecommunication lines attached to the EDI infrastructure or supported on TELUS poles.

- i) TELUS Communication Inc.

TELUS maintained aerial infrastructure along the west side of 50 Street, from the Sherwood Park Freeway to 90 Avenue. Additionally, underground duct lines and numerous vaults were present on both the east and west sides of 50 Street. The planned detour road, grade separation, and road widening works along 50 Street significantly impacted both aerial and underground TELUS infrastructure.

Utility coordination with TELUS was particularly challenging due to the proximity of their lines to the proposed detour road. It was critical to involve TELUS early in the project planning process. Recognizing this, TELUS proactively removed most of the affected infrastructure at an early stage enabling the timely construction of the detour road. An existing TELUS duct bank and vault had to be supported during the construction of the re-aligned Northeast Service Road.

ii) Shaw Cable systems Limited (prior to their acquisition by Rogers Communications)

Shaw Cable systems had existing infrastructure installed on both EPCOR's transmission and distribution poles along the east and west sides of 50 Street, as well as underground within the project limits. As part of the project, the relocation of an EPCOR transmission pole, coupled with EPCOR Transmission's requirement to not have any telecommunication attachments on their new transmission poles, necessitated that Shaw bury a section of its aerial cable and reroute it beneath the CPKC railway track. This relocation required close coordination between Shaw, EPCOR, and CPKC to ensure the work was properly sequenced and that continuous service to Shaw's customers was maintained throughout the process. Other utility coordination activities with Shaw Cablesystems ensured that other service connections were also maintained.

(iii) Zayo Canada

Zayo had an existing line that needed to be relocated. Through coordination with the project team and EPCOR Distribution, the relocation was accomplished easily and quickly.

Bell and Rogers communications infrastructure did not impact the construction of the overpass and were not relocated/decommissioned as part of this project. Bell Canada's trunk line within the CPKC railway right-of-way required some coordination efforts for the new EPCOR Water crossing.

The alignments of the existing and new telecommunications lines are shown in **Figure 9**.

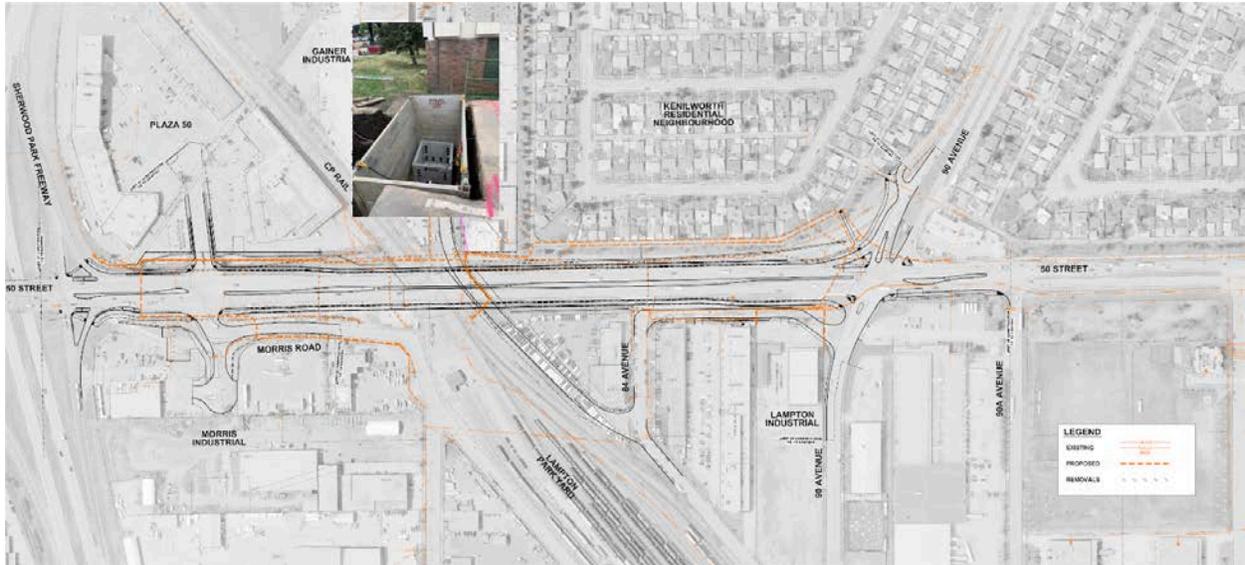


Figure 9: Existing and Proposed Telecommunications Alignments

Conclusion:

Utility relocations are frequently among the most significant risks to cost and schedule performance on infrastructure projects. In densely built corridors, they often emerge as the dominant factor influencing the schedule and cost associated with project delivery. On this project, 203 existing utility conflicts were identified consisting of gas, water, telecommunications, and electricity. These utilities were owned by 10 different entities which also included five (5) transmission pipelines and 1 (three) power transmission line. In addition, the presence of the CPKC railway crossing presented additional challenges and constraints associated with the relocation, abandonment, and removals of these utilities.

Early coordination with utility owners, detailed utility mapping, and phased relocation efforts enabled 95% of utility work to be completed prior to the start of overpass construction. This proactive approach was instrumental in mitigating delay risks and maintaining schedule integrity.