

An Innovative Funding Mechanism for Roadway Construction  
in  
Strathcona County's Industrial Heartland Area

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September 2017 Conference of the  
Transportation Association of Canada  
St. John's, NL

## Abstract

Investing in an efficient transportation system is crucial to a country's economy. While federal and provincial governments in Canada have access to income and consumption taxes, municipal governments typically rely upon property taxes, fees, and transfers from senior levels of government to fund transportation infrastructure. With modern fuel-efficient cars, alternative energy sources, and advanced technologies used in vehicles, fuel tax, as currently administered, may become a less reliable source of funding. Municipalities face a desperate need to find stable, long-term funding for vital roadway projects in an environment of increasing demands from users, downloading of responsibilities, dwindling or unreliable transfers, and reluctance from senior government to grant additional taxation powers. Municipalities have begun examining alternative funding mechanisms including local improvement taxes, development charges, user fees, tax increment financing, public-private-partnerships, and Contribution in Aid of Construction (CIAC). Strathcona County has expanded on the CIAC concept for funding infrastructure to support industrial growth in an equitable manner that manages risk and adheres to Alberta's Municipal Government Act.

Contribution in aid of construction is a condition placed on the approval of subdivision or issuance of a development permit that requires developers to enter into a development agreement with the municipality to construct or pay for the construction of particular roadways that give access to the development. Strathcona County is a specialized municipality located immediately adjacent to Edmonton, Alberta. The adoption and usage of a CIAC policy within Strathcona County's oil and gas-based economic expansion zone, the Industrial Heartland Area (IHA), has proven to be an effective, flexible, equitable and simple means of upgrading and constructing the system of local roads that satisfies the needs of industrial developers without putting undue financial burdens on industry or County taxpayers.

This paper discusses the advantages and disadvantages of many different alternative funding methods available to municipal government in Alberta; describes the experience Strathcona County has gained in implementing CIAC as a funding mechanism; and demonstrates how the CIAC system functions. Although it is recognized that no single method will work in all situations, in all communities, it is hoped that important lessons are conveyed through the example given.

## 1.0 Introduction and Background

In spite of a desire to increase in public transportation investments along with growth and expansion, installation of much needed new infrastructure in municipalities within Canada, specifically on roadways, has not been implemented in a quick enough pace as preferred; and existing highways are decaying faster than they can be renewed. Factors such as a low source of revenue and depleted level of transfer funding; population growth; increased safety and environmental requirements; inadequate maintenance; and sometimes a lack of consistency and uniformity in design, construction and operation practices; have all impacted on the adequacy and sufficiency of municipal roads. At the same time, an increased burden on existing roads due to significant business growth in some specific sectors such as heavy industrial areas, tends to quicken the need for new roads, accelerating the aging process of existing roads, while increasing the social and monetary cost of service disruptions due to maintenance repairs or replacement.

Similar to other small to medium size municipalities in North America, Strathcona County (SC) (Figure 1), a major population centre in Central Alberta, is faced with some or all of the above challenges. With a population of about 95,600 (2015 census) and rapidly growing, it is the fourth largest municipality in the Province of Alberta after the cities of Calgary, Edmonton, and Red Deer. Set in the centre of Alberta's energy and agricultural heartland, and situated immediately adjacent to the central eastern part of the City of Edmonton, the County is a thriving, successful and vibrant community.

To the north of the County, and located in the northeaster Greater Edmonton region (Figure 2), is Alberta's Industrial Heartland Area (AIHA) which is one of the world's most attractive locations for chemical, petrochemical, oil, and gas investment. AIHA is Canada's largest hydrocarbon processing region with operating investments of over \$30 billion annually. The region has over 40 companies, several of which being of world caliber and size, which provide fuels, power, petro-chemical products to provincial, countrywide, and global consumers. The region presently accounts for 43% of Canada's basic chemical manufacturing.

AIHA is a 194 square kilometer (75 square mile) area made up of portions of four (4) municipalities: the City of Fort Saskatchewan, Sturgeon County, Lamont County, and Strathcona County; with SC having the largest land area. To promote the safe and efficient installation, operation and maintenance of various oil and gas facilities within the region, and to entice new businesses, the County has viewed the provision of a comprehensive and efficient roadway network, complete with safe emergency evacuation routes, as a prime most requirement in its infrastructure provision. Despite its importance, however, it is also recognized that the region may not be receiving preferential treatment in terms of funding as hoped; and that alternative and other innovative means of finance have to be explored.

This paper gives an overview of the current conventional and unconventional practices of funding for roadways for municipalities in North America, with special focus on smaller to

medium size communities (population of less than 250,000 people) and on special regions with a specific business focus. It explores some of the key principles that underlie the question of who should pay for growth. The innovative funding mechanism referred to as Contribution in Aid of Construction, aka CIAC, for highway construction is introduced; and the experience gained by SC to move projects from their conceptual planning stage to on-the-ground realities in the Industrial Heartland Area (IHA) is showcased. The paper researches into, examines and compares the pros and cons of the many different funding methods currently available to municipalities in North America. A stepwise procedure of how the CIAC system functions is given. Other innovative and viable new initiatives are also explored.

Over the years, the adoption of a CIAC policy in SC has proven to be a very effective and successful method to raise the necessary funds for the construction of roadway infrastructure in the County's oil and gas based IHA. We are aware that there is no "one formula fits all" solution and that not a single method of funding will work in all communities and under all circumstances. It is hoped though that moving forward valuable lessons will be learnt through real life experiences gained and strategies be improved/ revised along with the process, through the example given.

## **2.0 Conventional and Innovative Methods of Roadway Funding**

Except for private roads within individual owners' property, public roads are most commonly constructed and maintained by the three levels of government.

Historically Federal Government in Canada has used federal gasoline or fuel taxes as an attractive, easy-to-administer, equitable, and relatively stable and predictable source of revenue for highway construction, operation, and maintenance (O&M) programs. On a smaller scale, federal government have also used tire tax, truck sales tax, and heavy vehicle use tax as variation to the same theme to supplement the larger income (90%) from basic fuel tax [Reference 1].

At the provincial/territorial level, provincial-level fuel taxes and other road-related fees such as motor vehicle licensing and registration fees, as well as traffic violation fines, contribute the most to cover a large portion of the same costs [Reference 2].

Municipalities have limited ability to generate the necessary income and no authority to levy a gasoline tax. They tend to rely heavily on either the traditional property tax fund or on transfer funding from the two higher levels of government as a source of income. The Federal Gas Tax Fund (GTF), for example, assists municipalities by providing funding for local infrastructure projects towards local roads and bridges, highways, and public transit [Reference 3]. The Strategic Transportation Infrastructure Program (STIP) run by the Alberta government provides financial assistance to municipalities for developing and maintaining key transportation infrastructure that promotes economic growth and improves mobility while creating jobs

[Reference 4]. Similarly the Basic Municipal Transport Grant Program [Reference 5] has been a primary source of revenue for major cities and municipalities in Alberta. This latter consolidated program was evolved from several transportation funding programs including a) City Transportation Fund; b) Basic Capital Grant; c) Provincial Highway Maintenance Grant; d) Streets Improvement Program; and e) Rural Transportation Grant.

Local governments sometimes use taxes, and general grant funding unrelated to highway users to finance their roadway programs. In recent years, a lot of smaller municipalities have been experiencing increasing growth pressure and subsequently a demand for infrastructure expansion; resulting in a larger demand for funding. However, with modern fuel-efficient cars, a growing disparity in vehicle fuel economy, lower gasoline prices, alternative energy sources, and a shrinking gas tax base, fuel tax revenue and transfer funds from the two senior governments are progressively dwindling. Faced with fierce competition from the bigger cities often with a larger appetite and greater influence, thus commanding a lion's share for infrastructure building dollars, smaller municipalities are increasingly experiencing new challenges of meeting desperate funding requirements for roadway projects with traditional means. Local municipalities have therefore begun to explore both conventional and unconventional, or innovative yet permissible funding mechanism to satisfy their roadway infrastructure needs [Reference 6]. These include the use of specialized taxes (e.g. local sales taxes in supermarkets and stores, as in California, U.S.A.); local option tax; road-pricing mechanisms in major cities (as in Vancouver, British Columbia; and what was recently proposed in the Don Valley Parkway and the Gardiner Expressway in Toronto, Ontario); public-private partnership (P3) for major highway projects (as in Edmonton and Calgary, Alberta); direct user fees; commuter taxes; incremental financing or tax-base sharing; land value taxation; toll lanes (as the tunnel between Detroit, U.S.A.; and Windsor, Canada); high occupancy toll lanes; bonds and bond financing; carbon funds and carbon taxing; land value taxation; fuel tax transfers; revolving funds; special district financing and special levies; standard offer contracts; tax increment financing; development cost charges; and what is referred to as CIAC charges.

### **3.0 Funding Philosophy for Municipalities**

The funding mechanisms described in the last paragraph of the above section are some of the many innovative methods used by different municipalities to offset funding deficiencies for the construction of new infrastructure facilities including roadways necessary to sustain growth and development. Given that municipalities are restrained by stature to have only limited or no powers to impose a transportation-specific tax, downloading of responsibilities for more supportive services from senior levels of government without a concomitant increase in transfer revenue has left the former entities in a precarious position, forcing them to develop new methods that are best suited for their communities with their specific needs. Amongst the myriad of seemingly uncoordinated and disconcerted efforts as listed in the preceding section, the National Guide to Sustainable Municipal Infrastructure [Reference 7] has come up with a variety of generalized alternative funding mechanism. We have further attempted to classify the different innovative methods into four (4) broad-base generic groups, as follows:

1. Special levies
2. Utility models
3. Financial methods
4. Development fees (including CIAC)

While all four (4) classes of funding will work under one circumstance or another, this paper focuses on a variation of the development fee concept (4), known as CIAC, as the most appropriate way to the funding of roadway construction in the heavily oil and gas Industrial Heartland Area within SC.

Without dwelling too much on details on the first three classes (1 to 3) of innovative funding, special levies (1) are used as a strategy to generate more funding for a municipality to cover a new service not traditionally covered by the general tax base, or a specific service offered to only a portion of the community, such as environment protection or transit services (example: in Halifax, Nova Scotia, new asphalt overlay; in Portland, Oregon, transit LRT). Chief amongst the approach's challenges include communication issues and the establishment of "buy-ins" from the public for the new service earmarked for funding initiative. This levy has limited application in funding transportation infrastructure for smaller size municipalities or for smaller size projects.

Utility models (2), as the name implies, are cost recovery mechanism for a service separated from other municipal services; and are most conveniently applied to utility-type services such as portable water; storm water, solid waste management systems; and in the case of transportation infrastructure, toll bridges (example: in New Glasgow, Nova Scotia; bundled services). The major difficulty in applying the utility model approach is public acceptance in areas where services are being delivered at rates subsidized by the general tax base.

Other alternative financial funding mechanisms (3) for transportation include (a) private or corporate sponsorship in exchange for some form of company or commercial name recognition by way of advertisement (example: in Okotos, Alberta; recreational park); (b) innovative transportation revenues and incentives involving an agreement in which a portion of the provincial fuel taxes collected at gas pumps be redistributed to municipalities for road O&M (operation and maintenance) or capital road infrastructure (example: in Calgary and Edmonton, Alberta; however both cities are now planning to negotiate a re-distribution); (c) funding partnerships in the form of the prevalent and popular public-private partnership, or PPP (example: in Winnipeg, Manitoba; new bridge).

Development fees approach (4), of which CIAC is one of the branch-off variations, is, in its most basic form, an economic instrument that ensures municipalities have a revenue source to fund the municipal infrastructure such as roads required as result of new private development in a particular area or region. Development fees can also be used to ensure a future reserve fund exists for operation and maintenance of infrastructure. Although not particularly new or unique as a concept; development fee approach, in one form or another, can be used innovatively by municipalities, as in the case of in the Industrial Heartland Area in SC, to influence development trend and direction in accordance with the community's strategic planning and economic goals. Ultimately a well-designed development fee structure is a valuable tool which is used to link to a unique, holistic, and long-term planning processes.

#### **4.0 CIAC as an Innovative Solution**

Contribution in Aid of Construction (CIAC) is a relatively new method of funding mechanism which has its legal basis built on the Municipal Government Act, or MGA, [see Section 5.0 and Reference 8]. As applied to roadway construction it is in essence to require as a condition of subdivision, or issuance of development permit, that private sector developers, collectively and/or singularly, enter into an agreement with the municipality to construct or to pay a share of the construction of roadways within specifically set-aside regions referred to as contribution basins/zones that are required to give access to the subdivision. CIAC includes amounts transferred from advances for construction representing any un-refunded balances of expired refund contracts or discounts resulting from termination of refund contracts.

SC is one such medium size municipality which has pioneered in the use of CIAC funding in the construction and improvement of its roadways in the northern part of the County known as its Industrial Heartland Area (IHA). The County's economy is heavily pegged to the oil and gas industry, and as a result SC has paid great attention to the provision of adequate infrastructure support and superior service, including the construction of an efficient and safe roadway network, to entice investors to come to its heartland area. To support this expansion goal, the CIAC funding approach is adopted to defray the sometimes insufficient funding to help in the roadway construction program. In the following section the CIAC process will be described in some detail.

#### **5.0 CIAC - How it Works - Pros & Cons**

Strathcona County's Industrial Heartland Area (IHA) is an economic expansion zone within Alberta's capital region. The IHA is bounded by the North Saskatchewan River to the north and west, Highway 830 to the East, and Highway 15 to the South. The rural roads within the area were originally constructed to service the predominantly agricultural land use. With the creation of a new economic zone promoting development of the oil and gas industry, significant infrastructure upgrades are required to accommodate the changing character and increased traffic volumes associated with this expansion. SC has created a balanced and innovative road improvement program to facilitate efficient industrial development, mitigate risk, and fund road upgrade projects.

The intent of the road improvement program is to fund and construct road upgrades associated with the region's expansion. This program provides a clear, effective, and fair funding mechanism that utilizes a preplanned transportation network and estimated project costs to establish a reasonable contribution from developers. Developers are aware of potential obligations at early stages in the development process. As the County has limited opportunities to collect funding for road upgrades, Strathcona has, in partnership with industry, setup an innovative system known as Contribution In Aid of Construction (CIAC) whereby a cost contribution agreement is entered into as a condition of subdivision or issuance of a

development permit. The County retains ultimate control of road network strategic planning and construction while funding is provided by industry.

The County's goals for the IHA are as follows:

- Promote industrial development in the IHA;
- Facilitate, not interrupt or delay, development;
- Mitigate financial risk to Strathcona residents while avoiding imposing impractical obligations on developers;
- Retain control over roadway construction projects;
- Provide access to grants and special programs not available to developers;
- Provide just-in-time funding for road projects;
- Establish a formula and funding mechanism to fund the design, construction, and installation of road improvements within the IHA, as outlined by the Strathcona Area Industrial Heartland Transportation Study Update [Reference 10] and empowered by the MGA;
- Create a direct linkage between development, infrastructure projects, and fees;
- Provide information to potential developers on probable infrastructure costs;
- Provide flexibility and options for CIAC.

The legal basis for CIAC comes under Alberta's Municipal Government Act (MGA), RSA 2000, Chapter M-26. The County uses powers provided in Section 650, *Condition of issuing development permit*, and Section 655, *Conditions of subdivision approval*, in order to collect the funds. It requires that developers enter into an agreement as a condition of issuance or approval. The agreement specifies developer fee obligations for the design, construction, and installation of required road improvements. Within the IHA, land is divided into contribution basins; infrastructure projects are attributed to the various basins so developers pay for roads that directly impact their developments rather than funding IHA infrastructure in general.

The Capital Cost Recovery for Heartland Roads policy establishes the formula and funding mechanism to pay for the planning, design, construction and installation of road improvements. Rather than requiring the first developer to provide all funds to construct roads to an oversized specification that would unfairly benefit future developers or requiring developers to construct all roadways within the IHA, the policy provides a balanced approach, minimizing financial risk to the residents while providing a means to fund upgrades supporting industrial development. This balanced approach encourages orderly and efficient development in the area, without putting unfair financial obligations onto the first developers or onto residents by funding road projects through tax or general grant funding.

The CIAC program ensures funding is received and available before the County undertakes the construction of required road infrastructure; which reduces risk to the County. While just in time funding is the goal, SC has limited windows of opportunities to enter into agreement with developers. Consequently, execution of a cost contribution agreement upon typical subdivision and development milestones is necessary, together with payment of an initial contribution even before road construction takes place. If developers do not wish to make an oversized contribution to trigger construction, the funds are retained by the County until such time as the road project is triggered. Ultimately, SC maintains control over the timing, sequencing,

estimated costs, tendering of work, calculations for proportionate share, funding, reconciliation of costs, and standards used for construction and installation of road infrastructure.

The proportionate shares of construction costs are calculated based on the title area of the parcel being developed or subdivided rather than simply by road frontage. This is inherently a fair means of apportioning shares prior to knowing the specific needs of the development. Proportionate shares are based upon the assumptions that the entire parcel will be developed or used for the highest and best use of affected lands; and utilized to the maximum intensity of development and use; and the land will receive the maximum benefit of the road construction.

The IHA is divided into CIAC contribution basins or zones. Each basin contains a number of road upgrade projects. The unit CIAC rate is calculated by summing the estimated costs of associated road construction divided by the developable (titled) area within the zone, as follows:

Total Estimated Road Project Costs for Basin (\$)/Total Contributing Zone Titled Area (ha) = Unit CIAC Rate (\$/ha)

The CIAC fee included in the agreement is calculated as unit CIAC rate multiplied by the parcel title area. Site specific charges for individual parcels are also included in the agreement or become the responsibility of the developer to construct. Because costs are initially estimated, there may be a need for supplemental adjustments to fees as part of the agreement. Final reconciliation is completed after the final acceptance certificate has been issued. When one developer has provided an oversized contribution, the County collects subsequent agreement fees and reimburses the over-contributing developer on behalf of those benefiting owners who, up to that point, did not provide their initial contributions. The non-participating owners within the contributing basin will ultimately provide their financial contribution to the developer(s) that provided the oversized contribution.

To manage the process, and to minimize the County's risk, contributions from the developer occur in five phases: 1) Initial contribution - payable upon execution of a Cost Contribution Agreement, based upon the estimated cost and proportionate benefit of projects; 2) Supplemental contribution - payable prior to commencement of construction and upon receipt of tendered costs for construction; 3) Oversized contributions - when and if applicable, payable prior to commencement of construction and upon receipt from the County that the tendered costs for construction is under-funded due to incomplete participation by all adjacent benefiting parcels; 4) Supplemental or oversized Contribution - payable during construction in the event that the County experiences cost overruns in respect of any individual project.; and 5) Final contribution/Refund - payable or refundable upon final accounting of all project costs, cost escalations and overruns, grants and cost savings. Upon completion refunds are provided to developers on a proportionate basis for funds collected in excess of costs.

The cost contribution agreements have two exemptions. First, on-going agricultural zoning use does not trigger a cost contribution agreement. Second, small, non-intensive industrial developments, at the sole discretion of the County, may make a one-time payment without the requirement for supplemental or final payments. The amount is still based on the CIAC rate for the basin and the title area. However, this payment is considered full and final. As such, the

developer will not receive any reimbursement for any grant funding or project reconciliation. In turn, the County will not seek supplemental contributions.

The CIAC methodology provides a clear, easily administered, and balanced means of funding road upgrades associated with the development of the IHA. Developers are aware of obligations associated with subdivision or development of parcels within the IHA and developers pay for roads that directly impact their developments rather than funding IHA infrastructure in general. CIAC provides flexible means for supplemental and oversized contributions that promotes efficient development and mitigates risk to both residents and industry. CIAC provides just-in-time funding for just-in-time construction.

CIAC applications are not without limitations or challenges. Basic assumptions regarding the intensity of development may be a challenge to developers. Likewise, developers may wish to stage parcel development. However, Strathcona County has endeavored to keep the CIAC formula simple and applies the same CIAC formula to the cost contribution agreement. The County has assumed that development would proceed northward from Highway 15. Development in the northern part of the IHA may require a large oversized contribution to construct intermediate infrastructure through other CIAC basins. Oversized contributions may take a lot of time to be reimbursed, since funds must be collected from other developers. Developers may pay CIAC fees but not trigger construction and may not wish to make an oversized contribution. Development is subject to the volatilities of the oil and gas industry. Development within the IHA has diversified from the original vision from a small number of large facilities to a large number of smaller facilities. The current CIAC approach will take some “trial and error” steps over time with respect to the rate structure charged for different basins to shape land use patterns in the desired direction.

## **6.0 Conclusions and Outlook for the Future**

In recent years, North America has witnessed a continuous and steadfast decline in the investment for highway infrastructure, which arguably forms the crucial backbone to a country’s sustainable economy. Based on published statistics, our roadway infrastructure is rapidly aging and deteriorating. At the same time, our highway construction and maintenance programs have been severely compromised due to an inadequate source of or retreat in funding at all levels of government. With modern efficient cars, and emerging technologies of less gasoline-dependent vehicles such as electric and connected cars, federal and provincial/territorial governments must seriously examine the continual relevancy and applicability of the traditional gasoline tax at the pump as a stable and the primary source of income in the funding of roadways [Reference 11]; and to start looking into alternate or replacement taxing structures that rely less on world fluctuation in gas prices; but which are more representative, reliable, and equitable for and to all roadway users. Municipal governments must concede that the sole reliance on transfer dollars from senior governments is unrealistic and untenable; and that new and innovative funding mechanisms must be explored.

The transition path to new funding mechanisms for municipalities is not clear, and it will likely vary among different jurisdictions. Irrespective, developing a consensus method of alternative approaches will take time and need public involvement/endorsement; with each municipality having its unique set of requirements and constraints. This paper has introduced some of the many innovative approaches used in North America to offset the high cost of implementing a sound roadway system in a local area context. Public sector may need to contemplate some new ideas, thinking out of the box. The Harvard Business School, for example, has recently published an article [Reference 12] on “What Africa Can Teach the United States About Funding Infrastructure Projects” in which it was explained how innovative methods of financing and banking in a third world continent can help cash strapped jurisdiction in finding the money needed for infrastructure installation. Likewise, the City of Omaha’s answer to costly roadway repairs and maintenance of potholes and roadway renewal is simply to “go back to gravel roads” may prove to be a workable solution [Reference 13]. While these ideas may sound too much outside of the norm for the conservative, and too far-fetched to be practical to many, it does demonstrate that moving forward, given the current tight fiscal environment, all options should be on the table for serious consideration.

The CIAC (development fee) approach to funding roadway upgrades in the IHA within SC has proven to be a successful mechanism in raising funds to ensure a safe and efficient roadway system; and has been largely accepted by all tenants in the oil and gas industry in the IHA. It must be remembered though that there is no one single panacea solution that can be applied universally which will solve all problems. Municipalities need to continue to be vigilant in their continual search for a mechanism that will best suit their set agenda.

## **Acknowledgment**

The authors wish to thank Ms. Danielle LeGrow of Strathcona County for help in preparing the figures in this paper.

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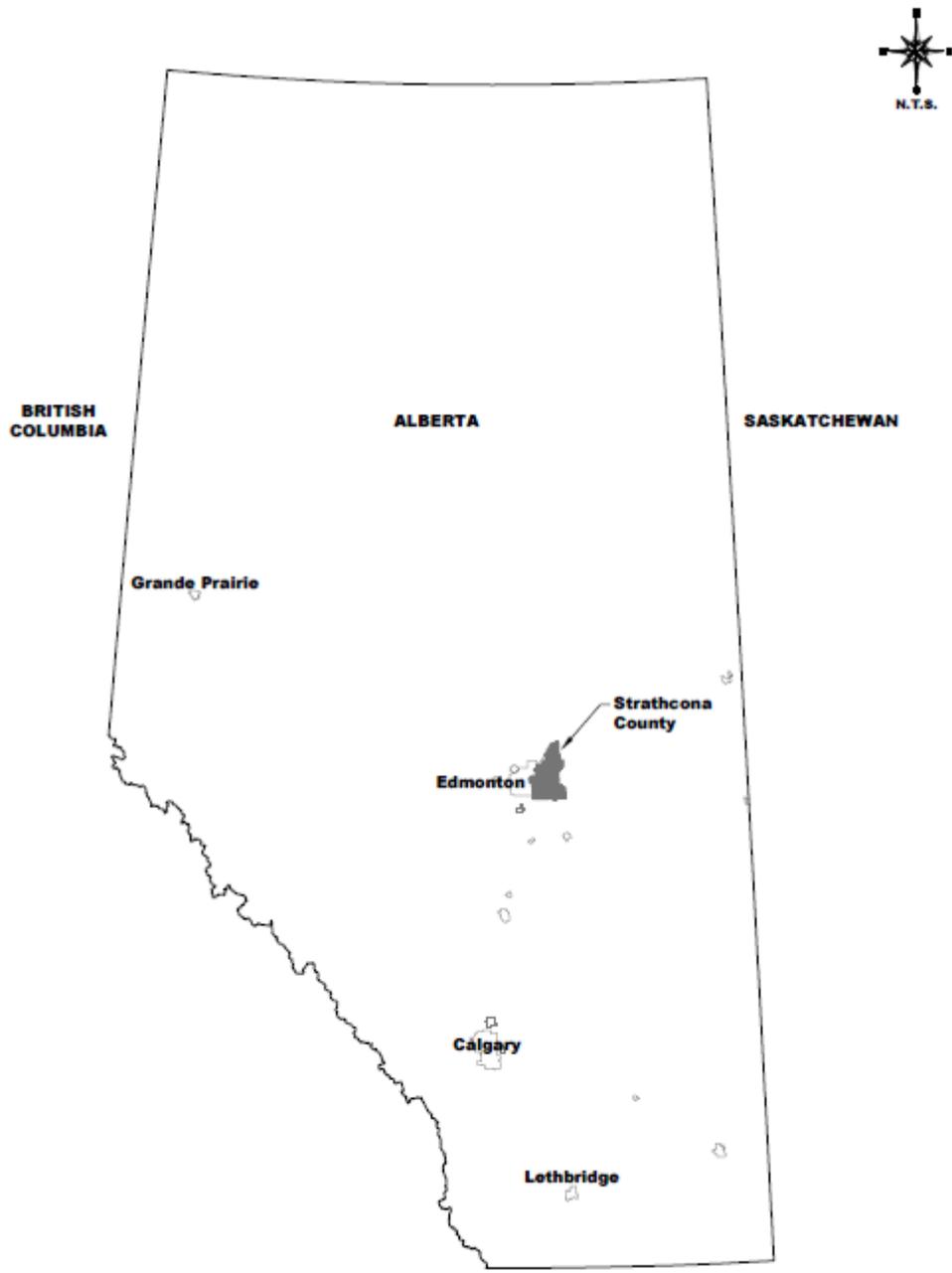


Figure 1: Strathcona County Within Alberta

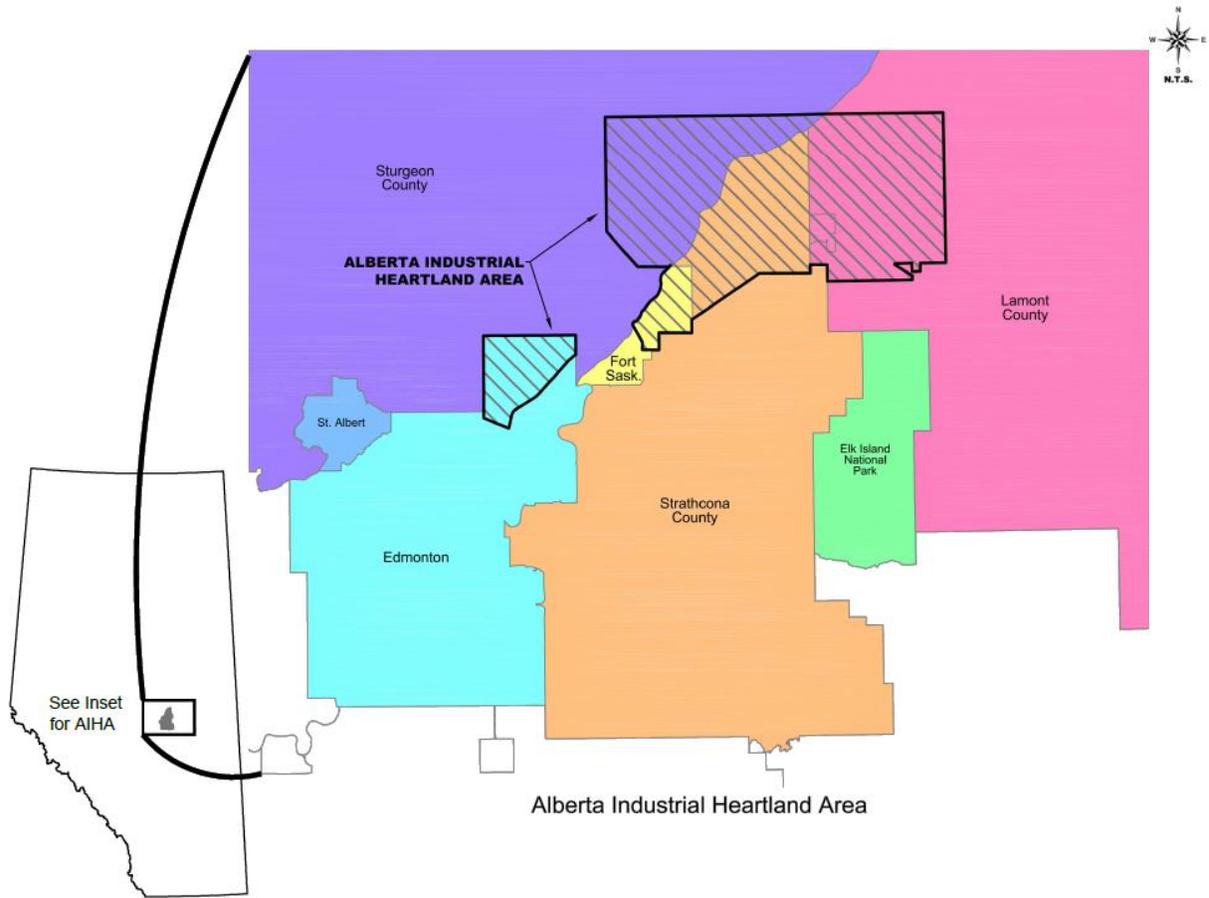


Figure 2: Alberta Industrial Heartland Area Location Map