

# **BENCHMARKING OF INDUSTRIES WITH PRICE REGULATION**

## **AESO TARIFF STUDY**

**Prepared for:**

**Alberta Electric System Operator (AESO)**



***Submitted by:***

Navigant, A Guidehouse Company  
First Canadian Place  
100 King Street West | Suite 4950  
P.O. Box 64  
Toronto, ON M5X 1B1  
Canada  
guidehouse.com

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## **EXECUTIVE SUMMARY**

Infrastructure-intensive industries, including electrical transmission and distribution utilities, are required to make large long-term investments. These high costs are often recovered through rates which are designed following certain principles that vary among industries but at a high level must be fair, reasonable, non-discriminatory for all customers and allow cost recovery to sustain the business. Many infrastructure-intensive industries have been subject to direct price regulation; however, in recent decades, there are examples of deregulation or partial deregulation in industries to promote competition or as a result of disruptive factors.

Navigant Consulting Inc. a/k/a Guidehouse (Navigant) assessed various industries in both the United States and Canada that either currently have regulated pricing or previously had regulated pricing that has since given way to competitive pricing.

Of particular relevance to electrical transmission are industries, including natural gas pipelines, telecommunications, and freight railroad, in which pricing structures aim to recover large infrastructure costs and allocate value among customers. Examining the ratemaking, cost recovery and cost allocation principles in these industries provides insights for electricity transmission rate design.

In many cases—such as for natural gas pipelines, basic-tier cable television and water and wastewater utilities—regulators utilize a cost-of-service methodology to set rates. The cost-of-service methodology allows operators to recover their investments over time and earn a reasonable return on their outstanding investments. Under this methodology, key ratemaking principles include allowing revenue recovery and a fair return for the regulated entities and ensuring reasonableness of rates, pricing comparability to alternative sources of service, and non-discriminatory among customers.

The taxi industry, in which businesses are not typically required to make large capital investments, uses direct price regulation instead of cost-of-service methodology. The taxi industry in both the U.S. and Canada is subject to price regulation from municipalities which set standardized fixed charges, volumetric charges and surcharges in order to ensure fare predictability for the customers and reasonable returns for owners and drivers. Regulation also includes limiting the number of taxi permits or medallions. Since the customers only pay for taxi service when they use it, limiting supply was the tool employed to help owners and drivers recover their investments. However, app-based ride-hailing services such as Uber and Lyft have flooded many markets with ample supply disrupting the supply and demand balance maintained by taxi industry regulations. These disruptive technologies largely operate on market pricing without any regulations.

Unlike the electricity transmission industry, many of the benchmarked industries have experienced some degree of deregulation, replacing direct rate-regulation with market-driven pricing, over the past several decades. For example, the telecommunications industry in both the U.S. and Canada has been deregulated in response to increased competition. Although price regulation still exists in the taxi industry, other aspects such as entry and exit restrictions have been deregulated. In the cable television industry, rates other than those for basic-tier services are deregulated. This means that service providers are free to set rates in response to market forces.

Deregulation that removed direct price regulation also occurred in the freight railroad industry in the United States. Legislation also specifically legalized the use of differential pricing, which is the practice of selling the same product to different customers at different prices. Along with mechanisms for captive shippers to dispute unreasonable rates with the federal government, differential pricing has proven to be an essential tool for maintaining the viability of the rail system.

Similarly, freight railroad deregulation in Canada removed direct price regulation. Pricing is largely determined by confidential contracts between shippers and railroads. Yet Canadian regulators do maintain direct price regulation in specific instances to promote competition, such as regulating inter-switching rates between competing railroads. Canadian federal regulators have also established mechanisms, such as mediation and arbitration procedures, for shippers to dispute rates they believe are unreasonably high.

Finally, municipal water utilities are an example of a capital intensive industry that has failed, in some jurisdictions, to develop pricing mechanisms that appropriately recover costs. For example, many municipal water utilities in Canada have historically failed to charge the fees necessary to recover their costs. As a result of decades of undercharging, utilities have lacked the capital to make infrastructure improvements and general tax revenue has been used to make up the shortfall in revenues. In response, there has been a movement over the past decade to implement regulations that will better align pricing with costs and ensure that costs are properly allocated to those who benefit from the water infrastructure.

The following table summarizes the benchmarked industries with respect to aspects of price regulation and pricing mechanisms. In describing aspects of price regulation, the table notes where industries have “bypassable” infrastructure, meaning that it can be avoided by utilizing alternative services.

**Table E-1. Summary of Price Regulation and Pricing Mechanisms in Benchmarking Industries**

| Industry                          | Price Regulation  | Tariff/Pricing Mechanism   |
|-----------------------------------|---|--|
| Natural Gas Pipeline Transmission | <ul style="list-style-type: none"> <li>• Deregulated commodity</li> <li>• Non-bypassable infrastructure; minimal substitution</li> </ul>  | <ul style="list-style-type: none"> <li>• Bundled. Regulated cost of service applies to pipeline infrastructure – operators recourse rate</li> <li>• Negotiated rates (bilateral commodity transactions), equivalent of bilateral electricity trading</li> <li>• Market based rates (spot commodity), equivalent of spot electricity trading</li> <li>• Market based storage rates</li> </ul> |
| Tele-communications               | <ul style="list-style-type: none"> <li>• Landline, mobile phone, and internet: deregulated after essential basic service</li> <li>• Large substitution (land vs mobile vs. VOIP)</li> <li>• Bypassable infrastructure due to high substitution</li> </ul> | <ul style="list-style-type: none"> <li>• Ubiquitous service fee for basic service (pays down the asset)</li> <li>• Additional usage charges per service (equivalent of retail choice)</li> </ul>   |

| Industry             | Price Regulation  | Tariff/Pricing Mechanism   |
|----------------------|---|--|
| Cable Television     | <ul style="list-style-type: none"> <li>• Deregulated past the franchise</li> <li>• Bypassable infrastructure due to high substitution</li> </ul>  | <ul style="list-style-type: none"> <li>• Basic-tier service and rates regulated for local franchising authority</li> <li>• Cable providers can sell additional features at market rates</li> </ul>   |
| Netflix              | <ul style="list-style-type: none"> <li>• Netflix is a value-added service streamed over internet infrastructure to customers that have purchased access to the infrastructure</li> </ul>                          | <ul style="list-style-type: none"> <li>• Unregulated pricing</li> </ul>  |
| Freight Railroads    | <ul style="list-style-type: none"> <li>• Differentiated pricing based on captive vs. non-captive customer</li> <li>• Captive customers can litigate the exercise of market power or unreasonable rates</li> </ul> | <ul style="list-style-type: none"> <li>• Differential pricing – charging different prices to different customers</li> <li>• Captive customers can be charged more than customers that have additional transportation options</li> <li>• Captive shippers can litigate to have the railroad demonstrate fees are reasonable (market-based rate authority)</li> </ul>  |
| Taxi                 | <ul style="list-style-type: none"> <li>• Regulated, but deregulated for disruptors</li> <li>• High substitution of regulated infrastructure with self-arranging infrastructure</li> </ul>                         | <ul style="list-style-type: none"> <li>• Infrastructure is known, limited, and regulated through the medallion system, like a franchise service territory</li> <li>• Medallions can be sold as a grid franchise can be sold. Rate card is approved for different services – per mile, idling, etc.</li> <li>• Uber and Lyft are self-arranging infrastructure; no rate card, such as a taxicab, use ‘surge pricing’ instead</li> </ul> |
| Water and Wastewater | <ul style="list-style-type: none"> <li>• Non-bypassable</li> <li>• No substitution</li> </ul>   | <ul style="list-style-type: none"> <li>• Historically, lack of regulated pricing mechanisms. However that is currently changing</li> <li>• Rate designs include cost of service regulation or volumetric block rates</li> </ul>  |

## **1. OVERVIEW OF THE REPORT**

Navigant developed this report, which examines price regulation in various industries in the U.S. and Canada, for the Alberta Electric System Operator (AESO) as part of a Tariff Study project. Navigant researched regulatory and pricing structures, focusing on rate-making principles, objectives and methodologies, in the following industries, as selected by the AESO:

1. Natural gas pipeline and transmission
2. Telecommunications (landline and cellular telephone)
3. Cable television
4. Netflix (Subscription based pricing model)
5. Freight railroad
6. Taxi
7. Water and wastewater

Section 2 of this report provides context and an assessment summary of each industry. The remaining seven sections of the report provide details regarding regulatory structures and pricing in each of the benchmarked industries. Each section provides an overview of relevant market regulation and pricing regulation of the industry in the U.S. and Canada as well as additional discussion of pricing principles, mechanisms and methodologies.

## **2. BENCHMARKING SUMMARY**

In order to compare the electricity transmission industry with other price regulated industries, it is important to understand the drivers for transmission infrastructure development. Transmission grid infrastructure requires upfront investment to serve the network customers by ensuring security and adequacy of supply and accounting for the projected increase in usage. Transmission grid expansion is driven by load growth and the ability to deliver energy economically to serve all network customers.

The transmission grid is built to reliably serve the peak demand of customers, therefore customers are responsible for paying for the cost of transmission system, even if the usage pattern, demand, or volume of energy consumption changes in the future. These costs are typically recovered by monthly coincident-peak demand<sup>1</sup> based rates for bulk transmission system and non-coincident peak<sup>2</sup> demand for local upgrades. However, changes in the supply mix and other disruptive trends, such as distributed generation, demand management, and energy storage, enable customers to reduce or eliminate their demand during peak periods thus avoiding the cost responsibility. These changes are accommodated in additional grid expansion projects to deliver energy economically and special-purpose public policy upgrades to remote resource locations. Alberta is experiencing similar issues where about two-thirds of the load, comprised of industrial customers, have sophisticated ways to manage their peak demand. This can result in undue cost shifting and create inefficiencies in revenue recovery for grid infrastructure. The goal of this benchmarking assessment is to scan the price regulations and cost recovery methods used in other industries and the impact of disruptions to gain insights for the transmission industry.

In this benchmarking assessment, we specifically reviewed other industries that require upfront investment and some sort of regulated pricing mechanism to ensure revenue recovery. We also reviewed the disruptions impacting these industries to the extent they have shaped the pricing structure and new pricing models that have emerged out of these disruptive forces, such as subscription-based pricing models for internet streaming services like Netflix.

The remainder of this section provides a summarized discussion of industries reviewed with details for each industry in subsequent sections of the report.

### **Industry-Specific Benchmarking Summaries**

#### **1. Natural Gas Pipeline Industry**

In the U.S. and Canada, the infrastructure-intensive natural gas pipeline industry is subject to market and price regulation from both federal and state or provincial governments. The Federal Energy Regulatory Commission (FERC) regulates interstate transmission rates in the U.S. while the Canadian Energy Regulator (CER) regulates interprovincial rates in Canada. Intrastate or intra-provincial regulation is the responsibility of state or provincial utility commissions. Rates are set to allow a company to earn a fair return on its investment while maintaining reasonableness for consumers. In most cases, rates are established

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<sup>1</sup> Meaning at the same time the AESO's system in total experiences peak demand.

<sup>2</sup> Meaning at the time of the customer's peak regardless of the overall peak.

through private contracts by using either the cost-of-service method, the negotiated rate method, or the market-based rate method.

This regulatory structure, especially the cost-of-service method, and rate-setting procedure is highly analogous and applicable to the electricity transmission industry. The natural-gas pipeline system is developed to serve the needs of firm load where available capacity can be offered to non-firm or interruptible load on an as-available basis. There is a secondary market for firm transportation rights, where firm transmission owners can sell their firm delivery rights on a pipeline to third parties and other market participants.

## **2. Telecommunications**

Although the telecommunications industry is relatively infrastructure-intensive, it is deregulated in the U.S. with respect to market structure and usage pricing meaning service providers are free to adjust prices in response to market conditions. Despite lacking the authority to regulate prices, the Federal Communications Commission and state Public Utility Commissions still play an important role in ensuring a competitive and accessible market, protecting consumers by requiring transparency in charges and dictating taxes, fees and surcharges. The minimum fixed charges recover the cost of building a telecommunications network and providing basic essential service.

Recently, significant market consolidation in the industry has raised concerns about unfair pricing and the ability to maintain a competitive deregulated market. In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) is responsible for regulating landline phone rates but not cellular phone rates. The CRTC also pursues deregulation when markets are deemed sufficiently competitive and has done so in the telecommunications industry. As a result, there is little remaining telecommunications price regulation in Canada.

## **3. Cable Television**

While generally deregulated along with the rest of the telecommunications industry, cable TV providers are subject to a specific form of price regulation aside from taxes, fees, and surcharges. Local franchising authorities (LFA) in the U.S. and the CRTC in Canada have authority to regulate the prices and content of basic tier services. Still, regulators in both countries lack the authority to regulate other tiers of service. The deregulated and competitive TV market structure is being threatened by the rise of online streaming disruptors in the past decade.

## **4. Netflix**

Netflix and other online streaming platforms are an example of a new, largely unregulated and non-infrastructure-intensive industry. As such, neither the market structure nor pricing of these companies are regulated, but rather a result of intense competition and business strategies. Pricing structure, which is based on a subscription model is not relevant to electricity transmission.

Netflix and other streaming services such as YouTube TV, Hulu, Amazon Prime, use the telecommunications network to stream their content over internet or cell phone data service. The customer pays for the internet infrastructure access regardless of the streaming service

used. This is analogous to sourcing energy supply from a particular generator; however, the transmission service is still needed to deliver the service and hence the cost associated with the transmission service must also be paid by the customer.

## **5. Freight Railroads**

The freight railroad industry is another infrastructure-heavy industry that has undergone deregulation since the 1980s. The expansion of highways allowed trucking services to capture a big share of the freight/cargo business and railroad companies were losing money under the regulated rates. In the U.S., railroads today are free to set rates in response to market forces and in particular are allowed to use differential pricing strategies, which allows them to charge different prices to different customers. To address concerns about market power, the Surface Transportation Board has established methods by which shippers/customers can litigate what they believe to be unreasonably high rates. Similarly, railroad rates have been largely deregulated in Canada through the abolition of collective pricing and the prevalence of confidential contracts. However, the Canadian Transportation Agency continues to regulate rates for competitive access reasons such as inter-switching and provides mechanisms such as Final Offer Arbitration to allow shippers to dispute unreasonable rates.

## **6. Taxis**

Although not heavily regulated at the federal level in the U.S. and Canada, the taxi industry is subject to regulations—including price regulation—from local city or county governments. Additionally, some Canadian provincial governments are responsible for taxi regulation. Pricing is typically structured with fixed base fares plus additional charges per mile or minute, and subject to approval and review by local authorities. However, these same pricing regulations do not apply to disruptive and unregulated ride-hailing services like Uber and Lyft who can price freely and have threatened the financial viability of the taxi industry.

Regulators of the taxi industry have traditionally limited the supply of taxicabs by limiting the number of permits or medallions that can be purchased by taxicab companies or individuals. By limiting supply and regulating rates, the local authorities attempted to meet demand for taxicab services while meeting additional objectives like providing sufficient revenues for taxicab owners to earn a fair living.

A medallion gives its owner the right to provide service at regulated rates with a certain service territory. In that way, a medallion is similar to a transmission company that has rights within a specific geography to provide service, charge regulated rates and be relatively confident that all investment costs will be recovered, and a reasonable return earned on that investment.

Medallions can be purchased directly from a local authority, if any are available, or on the secondary market. Over the last decade, medallions in some markets have dropped in value materially. Owners of those medallions can't be sure they will recover the cost of those medallions or even their actual costs of operating a taxicab. There is a parallel for the transmission industry. Just like Uber and Lyft have disrupted the taxi industry and reduced the value of a medallion, new technologies could enter the market (for example DERs and non-wires solutions) and impair the value of a transmission franchise. Owners of medallions

would not have thought it possible ten years ago that the value of a medallion had anywhere to go but up.

## **7. Water Utilities**

The water industry in the U.S. is heavily regulated at the federal level by the EPA and on the state level by Public Utility Commissions. This infrastructure-intensive industry is a mix of public and private providers. Rates, that are set using a cost-of-service model, are fair, reasonable, non-discriminatory for all customers and allow cost recovery to sustain the business. In contrast, Canadian regulation of water utilities has historically been lax. Water is often unmetered or priced using uniform rates that may or may not recover costs and in some cases incentivize overconsumption. Recently, several provinces have implemented policy changes that are causing municipal utilities to create rates that facilitate full cost-recovery.

### 3. NATURAL GAS PIPELINE INDUSTRY

#### 3.1 Overview of Natural Gas Pipeline Rate-Making in the U.S. and Canada<sup>3</sup>

In the United States, interstate natural gas pipeline tariffs, including the rates and terms and conditions of service, are established by the Federal Energy Regulatory Commission (FERC).

FERC's ratemaking authority is granted by and subject to the **Natural Gas Act (NGA) of 1938** and the **Natural Gas Policy Act (NGPA) of 1978**. These laws specify that rates, terms and conditions must be "just and reasonable" and not unduly discriminatory. The NGA was enacted to address concerns about interstate pipeline companies exercising market power. Although the gas industry today is dramatically different from what it was in 1938, exercise of market power continues to be a key concern for regulators today.<sup>4</sup> The NGPA directed FERC to create a single nation-wide gas market which "unbundled" the price of gas itself from the cost of transmission and storage. FERC is responsible for regulating interstate pipeline transportation rates but not the price of gas itself.<sup>5</sup>

Intrastate transportation of natural gas is generally regulated by state agencies such as utility commissions. For example, the California Public Utilities Commission is responsible for regulating the natural gas rates and services of investor-owned utilities within the state of California.<sup>6</sup> These state regulators typically follow ratemaking principles similar to those used by FERC at the federal level.

In Canada, interprovincial and international natural gas transmission is regulated by the Canadian Energy Regulator (CER, formerly the National Energy Board or NEB before August 28, 2019),<sup>7</sup> whose responsibilities correspond closely with those of FERC.<sup>8</sup> Most notably, the CER is responsible for approving interprovincial pipeline transmission tariffs. Like state-regulators in the U.S., provincial utilities commissions are responsible for regulating intra-provincial gas transmission, including pipeline contracts and tolls. Also like the U.S. gas market after the NGPA, most Canadian provinces have enacted legislation to "unbundle" the sale of gas itself from its transportation.<sup>9</sup>

#### 3.2 Key Regulatory Objectives

Two of the most important objectives in natural gas pipeline ratemaking are:

<sup>3</sup> <http://naturalgas.org/regulation/history/>

<sup>4</sup> [https://www.eia.gov/oil\\_gas/natural\\_gas/analysis\\_publications/ngmajorleg/ngact1938.html](https://www.eia.gov/oil_gas/natural_gas/analysis_publications/ngmajorleg/ngact1938.html)

<sup>5</sup> <https://www.ingaa.org/file.aspx?id=10751>

<sup>6</sup> [https://www.cpuc.ca.gov/natural\\_gas/](https://www.cpuc.ca.gov/natural_gas/)

<sup>7</sup> Under the Canadian Energy Regulator Act, the responsibilities of the former National Energy Board are now the responsibility of the Canadian Energy Regulator. All past decisions, orders and regulations made by the NEB are legally considered to have been made by the CER. <<https://www.cer-rec.gc.ca/bts/cr/index-eng.html>>.

<sup>8</sup> <https://www.energy.gov/fe/natural-gas-regulation-other-gas-related-information-sources>

<sup>9</sup> <https://iclg.com/practice-areas/oil-and-gas-laws-and-regulations/canada>

- **Allowing a Fair Return.** Established rates should permit the pipeline operator<sup>10</sup> a reasonable opportunity to recover its costs and provide a profit to investors. The pipeline operator also needs enough revenue to ensure it can meet its safety, environmental and other legal obligations.
- **Reasonableness.** Rates must be reasonable and fair to the pipelines’ customers.

### 3.3 Tariff Mechanisms

With limited exceptions, interstate transmission pipeline rates in the U.S. are established using one of three methodologies: the cost-of-service method, the negotiated rate method, or the market-based rate method. These mechanisms are summarized in **Figure 3-1**. The cost-of-service method is discussed in greater depth in section 3.6.

**Figure 3-1. Natural Gas Tariff Mechanisms**

|  |   |
|--|---|
| <p><b>Cost-of-Service Method</b></p>   | <ul style="list-style-type: none"> <li>– Pipeline operator submits cost and revenue data supporting requested rate</li> <li>– Operator allowed to recover its cost-of-service and earn reasonable return on its investment</li> </ul>   |
| <p><b>Negotiated Rate Method</b></p>   | <ul style="list-style-type: none"> <li>– Pipeline operator charges a rate agreed by the operator and shipper</li> <li>– To safeguard against unequal bargaining power, shipper has option to select service under operator’s “recourse rate” which is based on cost-of-service</li> </ul> |
| <p><b>Market-Based Rate Method</b></p> | <ul style="list-style-type: none"> <li>– May be employed when an operator can demonstrate that it lacks market power</li> <li>– Authorizes operator to charge rates consistent with market conditions</li> </ul> <p>interstate pipeline operators have market-based storage rates</p>     |

In Canada, pipeline capacity is typically allocated through contracts between private parties. The terms of these contracts are generally not subject to regulation by the federal government and can exhibit varying terms and prices. However, the CER (under authority from the National Energy Board Act) is responsible for ensuring that interprovincial pipelines are providing “equal tolls for equal service.”

Under these contracts, pipeline pricing is often negotiated based on the cost-of-service (see **section 3.6**). In these cases, the CER defines the fair rate of return on a pipeline operator’s investment. The CER also set standards requiring that rates are “**just and reasonable**” and exhibit “**no unjust discrimination.**” Finally, the contracts must also pass an “**economic**

<sup>10</sup> Pipeline operators do not own the product being transported but simply an intermediary providing service to producers and consumers.

**feasibility**” test that ensures that the operator’s investment will be recovered over the life of the pipeline.<sup>11</sup>

### 3.4 Interstate Pipeline Rate Characteristics

Interstate natural gas pipeline rates as approved by FERC are generally priced in one of three ways: by zones, by miles transported or with a fixed “postage stamp” rate.

- **Postage stamp rates.** Shippers pay the same rate<sup>12</sup> for transportation regardless of how far the gas is transported.
- **Zonal Pricing.** The price of transmission depends on the location of the receipt and delivery points with respect to geographically-defined zones.
- **Mileage-Based Rates.** Shippers pay based on the distance between where the gas enters the pipeline and where it is taken out of the pipeline.

Hybrid or mixed-rate pricing structures which blend these three structures also exist. For example, some pipelines use a combination zonal rate for upstream receipts and a postage stamp rate for market area deliveries. Additionally, FERC allows pipeline operators to discount rates at their discretion if it is done on a non-discriminatory basis.

Typical components of natural gas transmission rates include demand or reservation charges, commodity charges and fuel charges.

- **Demand or Reservation Charges.** A fixed monthly fee for reserving firm transportation rights.
- **Commodity Charges.** A volumetric usage fee for the amount of gas transported.
- **Fuel Charges.** A fee for fuel costs due to shrinkage or loss of gas during transportation.

### 3.5 Pipeline Services<sup>13 14</sup>

Interstate gas pipeline operators are mandated by FERC to offer a variety of services to their customers, which include both shippers (sellers) and end-users (buyers, typically utility companies or local distribution companies). These services carry their own FERC-regulated tariffs as appropriate.

- **Firm transportation capacity** is a direct agreement between the pipeline and a customer for a year or more to transport gas between primary receipt and delivery points. Shippers with firm transportation capacity generally receive priority to ship on the pipeline for the contracted quantity.

<sup>11</sup> <https://iclg.com/practice-areas/oil-and-gas-laws-and-regulations/canada>

<sup>12</sup> \$/MMCF, where MMCF is Million Cubic Feet; typical rate equation is (Cost of Service)/Volume

<sup>13</sup> [http://www.energysolutionsinc.com/ace-files/Energy\\_Glossary.pdf](http://www.energysolutionsinc.com/ace-files/Energy_Glossary.pdf)

<sup>14</sup> <https://www.ingaa.org/file.aspx?id=10751>

- **Interruptible transportation service** is an agreement between pipeline and customer which allows the pipeline operator to interrupt shipments on short notice (for days or hours) during times of peak demand or in the event of system emergencies. That is, gas is only moved on the pipeline if capacity is available. In exchange for interruptible service, customers pay lower prices to the pipeline operator. This service is offered under schedules or contracts on an as-available basis.
- **Secondary markets for firm transportation rights** enable customers to sell their pipeline capacity to third parties through FERC's capacity release program. Released capacity offers market participants the opportunity to buy and sell from each other as well as from the pipeline.
- **Park and Loan (PAL) services** enable customers to lend or borrow gas to or from the pipeline on a short-term basis. Short-term, intra-month storage needs can be met by pipeline and storage operators who offer this service. Excess supply can be "parked" temporarily during periods of reduced demand for delivery to the end-user at a future date. Users can also borrow molecules from the pipeline company during peak demand periods, which are repaid at a later date. Not all pipelines offer this service.
- **"No-notice service"** contracts allow customers to receive gas as-needed to meet their peak demand without paying any scheduling penalties as long as the daily maximum volume level is not exceeded. No-notice service is particularly valuable during periods of high demand when transportation capacity may be completely used by shippers who must serve their load without knowing their exact load each day. No-notice service is generally priced at a premium to firm transportation service. Shippers may temporarily release this service to other parties using FERC-approved capacity release guidelines.

### 3.6 Rate Base and Cost-of-Service

As discussed in section 3.3, the cost-of-service method is one of the primary mechanisms for determining pipeline transmission rates in both the U.S. and Canada. The first step in computing a pipeline's cost-of-service involves calculating the **rate base**. The rate base represents the total investment of the pipeline and is calculated with the equation shown in **Figure 3-2**. Like electric utilities, the rate base is used to compute the "Return" component of the cost-of-service, which permits the pipeline to earn a return on its investment. Additionally, components of rate base are used to calculate the Depreciation Expense included in the cost-of-service, which permits the pipeline to recover its investment.

The calculation of a pipeline operator's cost-of-service is performed with the equation shown in **Figure 3-2**. The calculation includes the product of the pipeline's Rate Base and the Overall Rate of Return, plus its Operation and Maintenance Expenses (O&M), Administrative and General Expenses (A&G), Depreciation Expense, Non-Income Taxes and Income Taxes, less Revenue Credits. The equations shown below are typical textbook equations for Rate Base and Cost-of-Service calculations and may include additional factors that vary for each pipeline operator.

**Figure 3-2. Typical Equations to Calculate Cost-of-Service**

**The Rate Base Formula:**

Gross Plant  
 - Accumulated Depreciation  
 = Net Plant  
 - Accumulated Deferred Income Taxes  
 + Working Capital  
 = **Rate Base**

**The Cost-of-Service Formula:**

Rate Base x Overall Rate of Return = Return  
 + Operation & Maintenance Expenses  
 + Administrative & General Expenses  
 + Depreciation Expense  
 + Non-Income Taxes  
 + Income Taxes  
 - Revenue Credits  
 = **Total Cost-of-Service**

**3.7 Benchmarking Summary**

In the U.S. and Canada, the infrastructure-intensive natural gas pipeline industry is subject to market and price regulation from both federal and state or provincial governments. The Federal Energy Regulatory Commission (FERC) regulates interstate transmission rates in the U.S. while the Canadian Energy Regulator regulates interprovincial rates in Canada. Intrastate or intra-provincial regulation is the responsibility of state or provincial utility commissions. Rates are set to allow a company to earn a fair return on its investment while maintaining reasonableness for consumers. In most cases, rates are established through private contracts or by using the cost-of-service method, the negotiated rate method or the market-based rate method. This regulatory structure and rate-setting procedure is highly analogous and applicable to the electricity transmission industry.

## 4. TELECOMMUNICATIONS

### 4.1 Overview of Telecommunications Regulation in the U.S. and Canada

The current regulatory structure of the telecommunications industry in the U.S. is a result of the federal **Telecommunications Act of 1996**.<sup>15</sup> As the first major legislation to address telecommunications law since the Communications Act of 1934, the 1996 Act resulted in the deregulation of the broadcasting and telecommunications markets which were converging at the time.

The key objective of the Telecommunications Act was to open the telecommunications market to competition by removing regulatory barriers to entry. In addition, the Act sought to provide a pro-competitive national policy framework that would rapidly accelerate private-sector innovation and the deployment of advanced information technologies (like the internet) in order to allow access for all Americans.

As a result of the 1996 Act, most telecommunications rates in the U.S. are **not** regulated by either the Federal Communications Commission (FCC) or state-level public utilities commissions.<sup>16</sup> That is, phone pricing rates, plan terms, and contracts with telecommunications providers are generally unregulated at the state and federal level. Regulators may require certain tariffs to apply for basic services or in accordance with other specific statutory requirements, but service providers are largely free to adjust their rates in response to market conditions.

Although it does not set rates, the federal government acting through the FCC does regulate the safety of devices sold by private companies and is also responsible for handling wrongful business practice claims against them. Both the FCC and state public utilities commissions are generally responsible for ensuring the successful implementation of a competitive and accessible market.

The deregulated nature of the telecommunications industry has resulted in significant market consolidation since 1996, as recently highlighted in the ongoing proposed merger of T-Mobile and Sprint.<sup>17</sup> From a regulatory perspective, market consolidation poses a threat to fully competitive market pricing and could be a driver of regulatory reform in the future.

In Canada, the regulation of the broadcasting and telecommunications industries is the responsibility of the Canadian Radio-television and Telecommunications Commission (CRTC). The CRTC is responsible for regulating all telecommunications and broadcast companies in Canada, regardless of whether they operate across provincial borders. The CRTC's activities are driven by the **Broadcasting Act 1991** and the **Telecommunications Act 1993**, and include

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<sup>15</sup> Long title: "An Act to promote competition and reduce regulation in order to secure lower prices and higher quality services for telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."

<sup>16</sup> The Federal Communications Commission regulates interstate and international communications by radio, television, wire, satellite, and cable in all 50 states, the District of Columbia and U.S. territories. <<https://www.fcc.gov/about-fcc/what-we-do>>.

<sup>17</sup> <https://www.forbes.com/sites/rachelsandler/2019/11/05/fcc-approves-26-billion-sprintt-mobile-merger-in-party-line-vote/#2bb59f3242bf>

licensing, approving telecommunications tariffs and generally encouraging competition in the market.<sup>18</sup> In sectors where there is adequate competition and consumer choice, the CRTC may roll back regulations to let market forces prevail.

## 4.2 Pricing of Cellular Phone Service

As a result of deregulation in the U.S., pricing for cellular phone services is primarily driven by market forces. Indeed, healthy competition among wireless providers has resulted in a continuing trend of lower wireless phone bills since 2008. However, some aspects of pricing—namely taxes, fees, and surcharges—are still mandated by federal, state, and local governments. According to the Tax Foundation,<sup>19</sup> these taxes, fees, and surcharges will amount to an estimated \$16.1 billion in 2018. Excessive taxes and fees—especially those that impose high per-line taxes and fees—impose a disproportionate tax burden on those least able to afford them.<sup>20</sup>

In Canada, the CRTC does not directly regulate prices or rates for cellular phone service.<sup>21</sup> However, the CRTC instituted the **Wireless Code** in 2013, which is “a mandatory code of conduct for providers of retail mobile wireless voice and data services.”<sup>22</sup> The Code places some restrictions on fees and charges. For example, consumers cannot be charged fees for cancelling a wireless contract after 2 years nor can they be charged unlimited roaming fees.

## 4.3 Pricing of Landline Phone Service

Like cellular phone service, usage rates for landline phone service in the U.S. are generally unregulated. But federal, state, and local governments may still impose taxes and fees in addition to specifying certain categories or classes of charges. These taxes and fees, as well as common usage charges collected by service providers, are described in Appendix A.

In Canada, the CRTC has greater authority to regulate local landline phone service than mobile service. This includes approving rates or tolls that are charged for phone service with the goal of balancing reasonable returns with universal access and affordability. However, the Commission’s authority is generally limited to large incumbent carriers, and regulations have been relaxed over the past decade in response to increased competition in the industry.<sup>23 24</sup>

## 4.4 Benchmarking Summary

Although the telecommunications industry is also relatively infrastructure-intensive, it is deregulated in the U.S. with respect to market structure and usage pricing meaning service providers are free to adjust prices in response to market conditions. Despite lacking the

<sup>18</sup> <https://crtc.gc.ca/eng/acrtc/acrtc.htm>

<sup>19</sup> <https://taxfoundation.org/cell-phone-taxes-2018/>

<sup>20</sup> <https://www.actwireless.org/blog/2018-wireless-taxes-and-fees>

<sup>21</sup> <https://www.thecanadianencyclopedia.ca/en/article/canadian-radio-television-and-telecommunications-commission>

<sup>22</sup> <https://crtc.gc.ca/eng/phone/mobile/code.htm>

<sup>23</sup> <https://www.thecanadianencyclopedia.ca/en/article/canadian-radio-television-and-telecommunications-commission>

<sup>24</sup> <https://www.mapleleafweb.com/features/canada-radio-television-and-telecommunications-commission.html#government>

authority to regulate prices, the Federal Communications Commission and state Public Utility Commissions still play an important role in ensuring a competitive and accessible market, protecting consumers by requiring transparency in charges and dictating taxes, fees and surcharges. Recently, significant market consolidation in the industry has raised concerns about unfair pricing and the ability to maintain a competitive deregulated market. In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) is responsible for regulating landline phone rates but not cellular phone rates. The CRTC also pursues deregulation when markets are deemed sufficiently competitive and has done so in the telecommunications industry; as a result, there is little remaining telecommunications price regulation in Canada.

## 5. CABLE TELEVISION <sup>25 26</sup>

### 5.1 Overview of Cable TV Rate-Making in the U.S. and Canada

Like the telecommunications industry, the cable TV industry in the U.S. is also generally deregulated in accordance with legislation including the Telecommunications Act of 1996 (see section 5.1). Thus, usage rates are generally **not** regulated by the Federal Communications Commission (FCC) and service providers are free to set prices according to market conditions.

Most cable TV service (including Internet Protocol TV) is primarily regulated by state-approved local franchising authorities (LFA), which are usually city, county or other governmental organizations. However, the regulatory authority of LFAs is also statutorily limited and generally restricted to rulemaking regarding customer service, franchise fees, and basic service charges.

In Canada, regulation of broadcast TV also falls within the jurisdiction of the Canadian Radio-television and Telecommunications Commission (CRTC). In the past, the CRTC has instituted price regulation of TV providers. However, over the past decade the Commission has stopped regulating rates in response to increased market competition in the market (for example, from satellite TV providers).<sup>27 28</sup>

In matters other than pricing, the CRTC maintains licensing requirements and other important regulations. Notably, the commission enforces the Canadian Content Rules, which are aimed at “protecting and promoting Canadian culture and achieving key social objectives” by requiring broadcasters to air a certain proportion of Canadian content.<sup>29</sup>

The cable TV industry today is undergoing significant disruption and competition by online streaming platforms. These platforms are subject to even less regulation than the telecommunications industry as a whole (see section 6).

### 5.2 Cable TV Tariffs and Tiers

Although the FCC and LFAs generally do not regulate cable TV rates in the U.S., LFAs are granted (but not required to exercise) the authority to regulate **basic tier** services and rates. Cable providers are usually required to offer a “basic tier” of programming to all subscribers before they purchase any additional programming. This basic tier must include local broadcast stations as well as public, educational and government channels as required by the franchise agreement between the LFA and cable company. LFAs may review any increases in basic service tier rates to verify that they accurately reflect increases in the cable company's programming or other costs that cable operators are allowed to pass through to customers.

<sup>25</sup> <https://www.fcc.gov/consumers/guides/regulation-cable-tv-rates>

<sup>26</sup> <https://www.fcc.gov/media/engineering/cable-television>

<sup>27</sup> <https://www.thecanadianencyclopedia.ca/en/article/canadian-radio-television-and-telecommunications-commission>

<sup>28</sup> <https://www.mapleleafweb.com/features/canada-radio-television-and-telecommunications-commission.html#government>

<sup>29</sup> <https://crtc.gc.ca/eng/cancon.htm>

Cable TV providers are free to set **rates for premium services**, which are any tier of service beyond the basic tier. Premium services include pay-per-channel programming, such as premium movie channels, and pay-per-program services, such as pay-per-view sports events. LFAs do not have authority to regulate premium service rates. However, service providers can be required by LFAs to pay **franchise fees**, which are fees paid for access to public rights of way, as well as an annual regulatory fee per subscriber for all the community units (CUIDs) in which they operate.

Similarly, the CRTC in Canada regulates TV rates for basic levels of service. Specifically, since March 2016, Canadian TV providers have been required to offer a basic package of service that is priced no higher than \$25 per month (excluding equipment costs).<sup>30</sup> Beyond this basic package, the CRTC also requires that additional channels (i.e. premium services) be offered either individually (called “pick and pay”) or in packages of up to 10 channels.<sup>31</sup> However, as in the U.S., the pricing of such premium content is not directly regulated.

### **5.3 Benchmarking Summary**

Although generally deregulated along with the rest of the telecommunications industry, cable TV providers are subject to a specific form of price regulation aside from taxes, fees, and surcharges. Local franchising authorities (LFA) in the U.S. and the CRTC in Canada have authority to regulate the prices and content of basic tier services. Still, regulators in both countries lack the authority to regulate other tiers of service. The deregulated and competitive TV market structure is being disrupted by the rise of online streaming services.

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<sup>30</sup> <https://www.canada.ca/en/radio-television-telecommunications/news/2016/05/crtc-continuing-to-monitor-implementation-of-new-basic-television-package-and-pick-and-pay.html>

<sup>31</sup> <https://www.canada.ca/en/radio-television-telecommunications/news/2016/03/crtc-welcomes-new-era-of-choice-for-tv-viewers.html>

## 6. NETFLIX

As an online streaming and production company, Netflix is an example of a disruptor to the cable TV industry. Netflix and its competitors (including Hulu, Amazon Prime, YouTube TV, etc.) are currently subject to even less regulation than the cable TV industry or other communications services, in no small part due to the recency of their creation and propagation.

Streaming services use internet, whether its availed through a telephone line, satellite service, cable TV, or cellular, and are independently priced from the internet access required to transmit the services. A comparable analogy would be to compare internet infrastructure with transmission and the content with retail choice or the commodity that is transacted over that infrastructure. It is important to review these disruptive products for the benchmarking because they have changed the way telecommunications sector, including television, telephone, and internet, is priced and regulated.

### 6.1 Netflix's Business and Pricing Strategy

Because of this lack of regulation, and driven by intense competition, online streaming companies such as Netflix utilize pricing structures that are almost entirely driven by their business strategies and competitors (market forces).

Netflix is premised on the following business models:<sup>32</sup>

- **Platform** (digital media marketplace) and **Pipeline** (entertainment content production, etc.)
- **Cutting-out-the-middleman** (production to distribution)
- **Unlimited subscription** (revenue model for unlimited online access)

Netflix's strategy stresses cost minimization and price minimization in order to increase market penetration and achieve aggressive intensive growth. While the overall goal is to keep prices as low as possible, Netflix's pricing structure includes several pricing tiers that allow for additional people to stream simultaneously

### 6.2 Benchmarking Summary

Netflix and other online streaming platforms are an example of a new, largely unregulated and non-infrastructure-intensive industry. As such, neither the market structure nor pricing of these companies are regulated, but rather a result of intense competition and business strategies. Pricing structures in industries such as this are not directly relevant to electricity transmission. Just like electricity customers in Alberta rely on the transmission and distribution systems to receive electricity, Netflix customers rely on the cable or fiber infrastructure to receive streaming services.

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<sup>32</sup> <https://www.rancord.org/netflix-business-model-generic-strategy-intensive-growth-strategies-competitive-advantage>

## 7. FREIGHT RAILROADS

### 7.1 Overview and History of Railroad Rate-Making and Regulation

#### 7.1.1 Freight Railroad Regulation in the U.S.

For much of the 20<sup>th</sup> century, the freight railroad industry in the U.S. was subject to strict rate regulation by the federal Interstate Commerce Commission (ICC) (now the Surface Transportation Board or STB).<sup>33</sup> By the 1970s, the industry was under intense financial strain, including several bankruptcies, which was generally seen as a result of burdensome and inefficient over-regulation.

In response, Congress passed two pieces of legislation, the **Railroad Revitalization and Regulatory Reform Act (4R Act) of 1976** and the **Staggers Rail Act of 1980**, to stabilize and eventually deregulate the industry.<sup>34</sup> This gave railroads more leeway to operate in the marketplace like other industries.

With the 4R Act, Congress first sought to: (1) provide the means to rehabilitate and maintain the physical facilities of the railway system; (2) improve the operations and structure, and restore the financial stability of the railway system; and (3) to promote the revitalization of railway system.<sup>35</sup> Then with the Staggers Act of 1980, Congress gave railroads much more freedom to decide what routes and services to offer and what prices to charge.<sup>36</sup> The Staggers Act also legalized differential pricing in the freight railroad industry (see section 7.2), which has proven to be an essential tool for maintaining the viability of a privately-owned and privately-funded national freight rail system in the U.S.

Together, these two pieces of legislation helped ease the regulatory burden on the freight railroad industry. Freight railroads today are largely free to set their prices in response to market forces. However, concerns about abuses of market power have long been present, and indeed the industry has undergone tremendous consolidation since the passage of the Staggers Act.<sup>37</sup> To combat this, Congress allowed the ICC (and now the STB) to maintain its longstanding authority to declare rail rates unreasonable. The STB is thus responsible for protecting consumers from abuses of market power by railroads on captive shippers (captive shippers are those companies that have only one choice – one railroad company – when shipping freight).

<sup>33</sup> The Surface Transportation Board (STB) (Interstate Commerce Commission (ICC) prior to 1996) has broad economic regulatory oversight of railroads, including rates, service, the construction, acquisition and abandonment of rail lines, carrier mergers and interchange of traffic among carriers. The STB also has oversight of pipeline carriers, intercity bus carriers, moving van companies, trucking companies involved in collective activities and water carriers engaged in non-contiguous domestic trade.

<sup>34</sup> [https://www.stb.gov/stb/rail/Rate\\_Reform\\_Task\\_Force\\_Report.pdf](https://www.stb.gov/stb/rail/Rate_Reform_Task_Force_Report.pdf)

<sup>35</sup> <https://definitions.uslegal.com/r/railroad-revitalization-and-regulatory-reform-act/>

<sup>36</sup> <https://www.aar.org/wp-content/uploads/2018/05/AAR-Short-History-American-Freight-Railroads.pdf>

<sup>37</sup> There were 40 major railroads in the U.S. in 1940. After decades of consolidation, in 2013 there were only 4 major railroads controlling over 90% of traffic. <<https://railvoices.org/wp-content/uploads/2012/12/Railroad-Regulation.pdf>>

### **7.1.2 Freight Railroad Regulation in Canada<sup>38 39</sup>**

Railroad regulation in Canada has a long history beginning with the first **Railway Act in 1851**. For over a century, additional legislation continually added regulations to the industry. Like in the U.S., a period of dramatic deregulation occurred in the decades after World War II that generally opened freight rail transport to competition and released much of the strict rate regulation that has existed before. Today, Transport Canada and the Canadian Transportation Agency (CTA) are the federal bodies responsible for regulating interprovincial railroads.

The era of deregulation began with the **National Transportation Act (NTA) 1967** which began the process of easing the industry into a competitive market framework. NTA 1967 repealed the strict regulation of railway pricing and replaced it with minimum and maximum allowable rates (the latter being based on variable costs and applicable to captive shippers).

Further deregulation occurred with the **National Transportation Act (NTA) 1987**. NTA 1987 abolished common or collective rate-setting by railroads, which reduced collusive behavior and promoted competitive pricing. NTA 1987 also permitted the negotiation of confidential contracts between shippers and railroads for prices and terms of transportation, created rules to increase the transparency of rates and replaced maximum rate limits with mediation and arbitration processes to allow shippers to dispute excessive rates (see section 7.4).

Further legislation, including the **Canadian Transportation Act 1996**, altered the rules surrounding the entry and exit of smaller railroad companies to promote so-called “shortline” rail services. The 1996 Act affected pricing regulation by adopting the principle that rates established by the CTA (such as inter-switching rates, discussed in section 7.4) must be “commercially fair and reasonable to all parties” and by abolishing a requirement that railroad rates must recover variable costs. Other minor regulatory changes since 2008 have generally increased the power of shippers to challenge rates but have done little to modify the underlying premise that railroads can set rates in response to market forces.

## **7.2 Differential Pricing in Railroads<sup>40</sup>**

Differential pricing, also known as Ramsey pricing, is the strategy of selling the same product at different prices depending on specific customers’ willingness to pay. This allows railroads to balance the desire of each customer to pay the lowest possible rate with the requirement that the overall network earn enough to pay for all the things needed to keep it functioning now and in the future. Under differential pricing, railroads generally price their services in inverse relation to “demand elasticity” (the price sensitivity of the traffic) by charging captive shippers higher “markups” over costs than they charge shippers with competitive alternatives. However, as a balancing force, captive shippers can combat excessively unreasonable rates by requesting a rate review with the STB in the U.S. (see section 7.3.2) or through prescribed mediation and arbitration processes in Canada (see section 7.4.2).

<sup>38</sup> [https://www.tc.gc.ca/eng/ctareview2014/pdf/Railway\\_Association\\_of\\_Canada/Appendix\\_B\\_-\\_Evolution\\_of\\_Canadian\\_Rail\\_Regulation\\_and\\_Industry\\_Performance.pdf](https://www.tc.gc.ca/eng/ctareview2014/pdf/Railway_Association_of_Canada/Appendix_B_-_Evolution_of_Canadian_Rail_Regulation_and_Industry_Performance.pdf)

<sup>39</sup> <https://ctrf.ca/wp-content/uploads/2014/07/34MonteiroRobertsonRailwaysinCanada.pdf>

<sup>40</sup> <https://www.aar.org/article/freight-rail-differential-pricing/>

## 7.3 Railroad Rate Regulation in the U.S.<sup>41</sup>

As a check on unregulated railroad pricing, the Staggers and 4R Acts directed the U.S. Surface Transportation Board to establish, and revise as necessary, procedures for determining whether rail rates are unreasonably high. Captive shippers are responsible for presenting arguments before the STB to prove that railroad rates are unreasonable.<sup>42</sup>

### 7.3.1 Revenue Adequacy

Like cost-of-service pricing mechanisms, a key consideration in determining the reasonableness of a rate is ensuring that railroads are earning adequate revenues. Adequate revenues are defined as those needed “under honest, economical, and efficient management,” to cover expenses, earn a profit, continue prudent capital outlays, and attract sufficient capital for maintenance and improvement of the rail network.

### 7.3.2 Proving Rate Unreasonableness

Captive shippers can typically choose from two different approaches when attempting to prove that a rail rate is unreasonably high. The first approach, **Constrained Market Pricing and the Stand-Alone Cost Test**, is relatively burdensome and complicated and thus is only used by the largest firms with the most resources (namely, coal shippers). The second approach, the **Three-Benchmark Test**, is more accessible to smaller shippers.

#### 7.3.2.1 Constrained Market Pricing and the Stand-Alone Cost Test

The ICC’s *Coal Rate Guidelines* established a set of constraints under “**constrained market pricing**” (CMP) principles pursuant to which a shipper could show that the rate set by a “market dominant” carrier was too high. Under CMP, a rate is to be found reasonable if it:

1. reflects the amount a captive shipper would have to pay to receive efficient service,
2. affords the railroad adequate revenues, and
3. does so without cross-subsidizing any service or facility from which the shipper receives no benefit.

To make the case that a rate is unreasonable, a shipper can opt to examine the railroad’s entire network for revenue adequacy or management efficiency.

Alternatively, a shipper can choose to examine only a subset of the network using the “**stand-alone cost**” (SAC) test—this is the option followed by nearly all shippers that file a rate case. The SAC test involves simulating a hypothetical “stand-alone railroad” (SARR) which is fully efficient and serving the complainant. A rail rate is declared unreasonable if it grossly exceeds the costs of running the simulated SARR plus a reasonable profit.

<sup>41</sup> [https://www.stb.gov/stb/rail/Rate\\_Reform\\_Task\\_Force\\_Report.pdf](https://www.stb.gov/stb/rail/Rate_Reform_Task_Force_Report.pdf)

<sup>42</sup> <https://www.aar.org/article/freight-rail-differential-pricing/>

### 7.3.2.2 Three-Benchmark test

Captive shippers can also use the **three-benchmark test** to attempt to prove that a rate is unreasonable. In this test, the reasonableness of a challenged rate is addressed by examining the revenue to variable cost ratio (R/VC) produced by the challenged rate in relation to three benchmark figures, each of which is also expressed as a R/VC ratio.

1. The first benchmark, the **Revenue Shortfall Allocation Method (RSAM)**, measures the average markup over variable cost that the defendant railroad would need to charge all its “potentially captive” traffic (traffic priced above the 180% R/VC level) in order for the railroad to earn adequate revenues.<sup>43</sup>
2. The second benchmark, **R/VC<sub>>180</sub>**, measures the average markup over variable cost currently earned by the defendant railroad on its potentially captive traffic.
3. The third benchmark, **R/VC<sub>COMP</sub>**, is used to compare the markup being paid by the challenged traffic to the average markup assessed on other comparable potentially captive traffic.

## 7.4 Railroad Rate Regulation in Canada

Railroad rate regulation in Canada follows the general principle of allowing competitive and market-driven pricing while providing safeguards and protections for captive shippers. In most cases, rates are negotiated privately between parties using confidential contracts.

### 7.4.1 Inter-switching and the Regulatory Costing Model<sup>44 45</sup>

Although not responsible for setting most rates, the Canadian Transportation Agency (CTA) does directly regulate rates for inter-switching. According to the CTA:<sup>46</sup>

*“Inter-switching is an operation performed by railway companies where one carrier performs the pickup of cars from a customer (shipper) and hands off these cars to another carrier that performs the “line haul” (the majority of the linear distance of the overall railway movement). The inter-switching arrangement is made in cases where a shipper has immediate access to a single carrier, but is within a defined distance (zone) to one or more of the competing carriers... Inter-switching provisions are considered to be competitive access provisions, allowing the shipper to choose their carrier despite having physical access to only one carrier.”*

In other words, inter-switching is regulated to allow captive shippers to access nearby competitors and therefore negotiate more competitive rates. The Canadian **Railway Inter-switching Regulations** require that railways must treat inter-switched traffic as equal to normal traffic and that they may not charge for the delivery of empty rail cars.

<sup>43</sup> As measured by the STB under 49 U.S.C. § 10704(a)(2)

<sup>44</sup> <https://otc-cta.gc.ca/eng/overview-agencys-regulatory-costing-model>

<sup>45</sup> <https://www.otc-cta.gc.ca/eng/publication/uniform-classification-accounts-and-related-railway-records-2014>

<sup>46</sup> <https://www.otc-cta.gc.ca/eng/interswitching-rates>

The CTA sets rates for inter-switching by using a **regulatory costing model** to determine total variable costs and then adding a contribution to allow for a return that is “commercially fair and reasonable to all parties.” Total variable costs are determined according to the **Uniform Classification of Accounts and Related Railway Records (UCA)**. The UCA defines specific methods and reporting rules for general accounting, property accounting, revenue accounting, expense accounting and operating statistics. The fundamental principles underlying the UCA are:

- “the costs of railway companies must reflect the consumption of an economic resource for the purpose of providing rail transportation service;” and
- “for the proper determination of which costs are “variable” and which are “constant” with respect to traffic volume, the costs must be reasonably matched to the time period in which the activity that incurred the costs was actually performed.”

These principles are intended to ensure that there is a causal relationship between the “real resources consumed” and the “activities that caused [them] to be consumed.”

The regulatory cost model and the UCA are also used by the CTA “to maintain the ability to intervene in a timely manner, where specified parties require Agency analysis as part of a formal dispute under the CTA.”

#### **7.4.2 Confidential Contracting and Final Offer Arbitration <sup>47</sup>**

Two other “competitive access provisions” that have helped shippers achieve lower rates are Confidential Contracting and Final Offer Arbitration (FOA). Confidential contracting allows for a binding agreement between a shipper and railroad to set the rates and terms of transport. The agreement is kept confidential between the parties in order to prevent collusive or common pricing by railways exercising market power. However, the contracts must be filed with the CTA.

FOA is a dispute mechanism originating in the National Transportation Act 1987 that allows shippers to remedy unreasonable rates or conditions of service. After a shipper initiates the FOA process, both the shipper and railroad are required to submit confidential “final offers” of proposed rates or terms to settle the dispute to an external (non-CTA) arbitrator. The arbitrator is then required to choose one of the offers, which becomes legally binding for an amount of time of the shipper’s choosing (up to two years). The arbitrator cannot modify the offers or develop a compromise.<sup>48</sup>

Aside from FOA, the agency has two other types of arbitration, *rail level of service arbitration* and *rail arbitration*, during which the Agency itself can act as the arbitrator and incorporate the regulatory costing model and UCA data.<sup>49</sup>

<sup>47</sup> <https://ctrf.ca/wp-content/uploads/2014/07/34MonteiroRobertsonRailwaysinCanada.pdf>

<sup>48</sup> <https://otc-cta.gc.ca/eng/arbitration-final-offer-arbitration>

<sup>49</sup> <https://otc-cta.gc.ca/eng/arbitration>

## **7.5 Benchmarking Summary**

The freight railroad industry is another infrastructure-heavy industry that has undergone some form of deregulation in the past several decades. In the U.S., railroads today are free to set rates in response to market forces and in particular are allowed to use differential pricing strategies. However, to address concerns about market power, railroad rates are subject to review by the federal Surface Transportation Board, which has established methods by which shippers can attempt to prove that a railroad rate is unreasonably high. Similarly, railroad rates have been largely deregulated in Canada through the abolition of collective pricing and the prevalence of confidential contracts. However, the Canadian Transportation Agency continues to regulate rates for competitive access reasons such as inter-switching and provides mechanisms such as Final Offer Arbitration to allow shippers to dispute unreasonable rates.

## 8. TAXIS

### 8.1 Overview of Taxi Regulation in the U.S. and Canada<sup>50 51</sup>

Taxis in the U.S. are subject to both industry and rate regulation. The industry as a whole falls under the jurisdiction of the Federal Trade Commission (FTC). However, most regulation is done on the local level by individual city and county governments as well as large airport authorities. The taxi industry can be broken into four distinct market segments: cruising cabs, taxicab stands, radio-dispatched cabs, and contract services. All segments are subject to regulation by local authorities.

#### Objectives of Fare Regulation

1. To ensure predictability in the amount customers will be charged
2. To eliminate price gouging
3. To ensure a reasonable return for owners and drivers

Historically, most taxi regulations came into effect after the great depression but some aspects of taxi industry regulation, particularly requirements for entry/exit and the number of cabs, have been deregulated in the U.S. since the 1980s (the level of deregulation varies by city/county). Common categories of regulation today include:

1. **Entry Regulation.** Entry and exit may be organized according to medallion<sup>52</sup> or permit systems, certificate systems, franchise systems or open systems. Entry regulation effectively limits the number of taxicabs.
2. **Fare Regulation.** Fares are always regulated by city or county governments.

**Service requirements and restrictions, and quality regulations** pertain to ensuring public safety and quality of service through vehicle inspections, driver training programs, and providing non-discriminatory<sup>53</sup> service within the assigned geographical area. Some regulatory issues—particularly safety but also fare metering—are approached similarly across jurisdiction, whereas control over market entry, pricing, geographic coverage and access for disadvantaged riders show distinct differences across jurisdictions.

Like in the U.S., taxis in Canada are not regulated at the federal level. They are regulated at the provincial level in British Columbia, Manitoba and Quebec, although Manitoba has been moving to delegate regulatory responsibilities to municipalities. In other provinces, taxi regulation is the responsibility of local city authorities. Even in areas where regulation is handled at the provincial level like British Columbia, there is often still a great deal of regulation that is left to the

<sup>50</sup> <https://www.nap.edu/read/21875/chapter/5>

<sup>51</sup> <https://www.ftc.gov/sites/default/files/documents/reports/economic-analysis-taxicab-regulation/233832.pdf>

<sup>52</sup> A medallion system is a government-created intentional constraint on the supply of taxicabs. Medallions confer the right to operate a taxi within a given jurisdiction and are freely tradable assets.

<sup>53</sup> Taxi owner/driver cannot discriminate based on economic reasons for picking up or dropping off a customer from a particular area or based on race etc.

discretion of individual municipalities.<sup>54</sup> The same categories of regulation—entry/exit, fare, service and quality—are present in Canada as in the U.S. However, Canadian regulators tend to maintain stricter entry and exit regulations by limiting the number of licenses, plates or medallions.

The taxi cab industry in both the U.S. and Canada has faced intense competition and disruption over the past decade from ride-hailing companies such as Uber and Lyft which are not subject to the same entry or fare regulations as traditional taxi operators (see section 8.4).

## 8.2 Taxi Rate Components

The major regulated components of taxi rates include fixed charges, per-mile or per-minute charges, and other charges that vary across jurisdictions.

- Fixed fare rates apply uniformly across all companies within a jurisdiction.
- Fares are usually calculated on the basis of an initial charge (the “drop”), along with mileage (when moving) and time charges (when idling).
- Other surcharges may also be applied, most commonly for additional passengers and luggage and based on time of day.

For example, rates established by the City of Toronto include:<sup>55</sup>

- a fixed initial charge of \$3.25 for the first 0.143 km or part thereof,
- an additional \$0.25 for each additional 0.143 km or part thereof,
- \$0.25 for each 29 seconds that a taxi is waiting “while under engagement;” and
- a \$2.00 surcharge for every additional passenger beyond the fourth.

Taxi fare rates are rarely set to vary in response to changing levels of demand for service. It is common to have a flat-rate fare for trips between regional airports and the city center to make the fares predictable and guard against overcharging. Unlike taxi fares, the fares charged by Uber and Lyft can change based on the level of demand (higher prices during busy periods called surge prices) and by the perceived quality of the car (higher prices for “premium” cars).

## 8.3 Taxi Fare Ratemaking and Review Processes

Rate-making processes are varied and may be reviewed periodically or at the request of the industry and can be politically charged. To evaluate taxi fares, regulators often conduct surveys

<sup>54</sup> <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/cvse/passenger-transportation/industry-notices/20180718-modernizing-taxi-regulation.pdf>

<sup>55</sup> <https://www.toronto.ca/311/knowledgebase/kb/docs/articles/municipal-licensing-and-standards/bylaw-enforcement/licensing-enforcement/taxis-taxicabs-vehicle-for-hire-accessible-taxis-fares-city-of-toronto.html>

of peer cities to assess relative fares with particular focus on the perception of business and leisure travelers.

The need for rate increases can be evaluated against standardized measures such as the consumer price index or price indices specially calculated to reflect taxi industry costs. Fares may be increased for the purpose of increasing driver earnings and sometimes in conjunction with caps on the lease fees that fleets can charge drivers.

## 8.4 Comparison with Disruptors

The major disruptors in the taxi industry, Uber and Lyft, are typically not subject to the same entry, exit and pricing regulations from local governments. Therefore, they utilize their own pricing mechanisms and often undercut the prices of traditional taxis. For example, Uber charges riders per mile and per minute whether they're moving or idling and offers varying rates for different tiers of service such as shared rides versus luxury rides. As a result of charging only for miles and driving time, the effective price drops as speed increases. They also use surge pricing mechanisms to increase prices during periods of high demand. Surge pricing can increase economic efficiency, but it also leads to concerns of price-gouging and price-instability. In some cases, Uber and Lyft may be required by local authorities to collect surcharges, such as for airport trips.

Intense competition and undercutting of fares from ride-hailing companies has threatened the financial viability of the taxi industry. With decreased revenues, taxi permits and medallions that were once extremely valuable assets have fallen dramatically in value.<sup>56</sup>

Some of the reasons that customers prefer using ride-hailing apps rather than traditional taxis include:

- the ability to order rides from their mobile phones;
- the ability to pay with credit cards through mobile apps;
- the ability to get a guaranteed price up-front; and
- the ability to rate and review drivers.

The presence of competition from Uber and Lyft has increased pressure on the existing taxi industry to improve their quality of service. In the pre-Uber/Lyft, era, entry restrictions that lowered competition (such as medallion or permit systems) often caused service to decline.

## 8.5 Benchmarking Summary

Although not heavily regulated on the federal level in the U.S. and Canada, the taxi industry is subject to regulations—including price regulation—from local city or county governments. In Canada, some provincial governments are responsible for taxi regulation. Pricing is typically

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<sup>56</sup> <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/cvse/passenger-transportation/industry-notices/20180718-modernizing-taxi-regulation.pdf>

structured with fixed base fares plus additional charges per mile or minute, and subject to approval and review by local authorities. However, these same pricing regulations do not apply to disruptive and unregulated ride-hailing services like Uber and Lyft who can price freely and have threatened the financial viability of the taxi industry.

## 9. WATER AND WASTEWATER UTILITIES

### 9.1 Overview of Water Utility Regulation in the U.S. and Canada

In the U.S., federal regulation of the water industry is conducted by the United States Environmental Protection Agency (EPA) under the authority of, among other laws, the **Clean Water Act (CWA) of 1972** and the **Safe Drinking Water Act (SDWA) of 1974**. EPA is responsible for regulating water systems, including drinking water, groundwater and wastewater.<sup>57, 58</sup> For example, EPA identifies drinking water contaminants and institutes regulatory limits for them in public water supplies.<sup>59</sup>

On the state level, Public Utility Commissions are responsible for implementing EPA standards. They are also charged with the general supervision and oversight of water and sewage utilities, including ensuring their financial and managerial soundness. Rates for Investor Owned Utilities (IOUs) and for local water utility districts run by city governments are set by these public utilities commissions.

Water utilities in the U.S. used to be private companies when they started a century ago before becoming predominantly municipal or public companies. In the past few decades, various degrees of privatization have re-emerged in the industry. Today, the degree of privatization is variable and can include:

- the private “outsourcing” of various services such as provision of supplies and meter reading;
- private contracts for the operation and maintenance of existing plants;
- private contracts for the integrated design, construction, and subsequent operation of new facilities (DBO “design-build-operate” contracts); and
- the sale of public utility assets to investor-owned companies that take responsibility for all operations, maintenance, and expansion of services.

The water system in the U.S. is a highly diversified industry. In 1999, there were nearly 54,000 community water systems, which are defined by EPA as systems serving more than 25 people regardless of ownership. Most of these water systems serve small populations as 85 percent of U.S. community water systems serve only 10 percent of the population.

In Canada, most water and wastewater utilities are municipal companies which are publicly owned, operated, financed and regulated.<sup>60</sup> Water in Canada generally has a reputation for being plentiful and cheap, and municipal utilities have historically charged very low water fees. In 2011, only 58% of households were equipped with water meters,<sup>61</sup> and in 2007, utilities

<sup>57</sup> <https://www.epa.gov/regulatory-information-topic/regulatory-information-topic-water>

<sup>58</sup> <https://www.epa.gov/sdwa>

<sup>59</sup> <https://www.epa.gov/dwstandardsregulations>

<sup>60</sup> <https://www.fraserinstitute.org/sites/default/files/WaterWastewaterTreatment.pdf>

<sup>61</sup> <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/residential-water-use.html>

recovered only 70% of their total costs through customer fees (the remainder was covered with general tax revenue). These low fees not only present financial challenges but also are thought to promote a general culture of overconsumption. In the water-intensive industrial and agricultural sectors, water is often self-supplied, self-funded and does not involve utility companies; the only requirement is to obtain a water license from the provincial government.<sup>62</sup>

As a result of decades of undercharging and underfunding, there has been growing alarm over the state of water and wastewater utility infrastructure in Canada. In the past several years, provincial governments have introduced new pricing regulations in an attempt to better align pricing with costs.<sup>63</sup> For example, with the passage of the Ontario Sustainable Water and Sewage Systems Act 2010, water and wastewater utilities in Ontario are now moving towards full cost recovery.<sup>64 65</sup>

## 9.2 Water Rate Structures

Regulated water rates in the U.S. generally follow cost-of-service principles (analogous to natural gas and electricity; see section 3.6). Commonly used pricing structures in the water industry include **uniform flat rate, single block rate, decreasing block rate and increasing block rate** structures. A description of each of these rate structures, along with advantages and disadvantages, is shown in **Table 9-1**. In Canada, municipal utilities tend to favor uniform flat rate or increasing block rate pricing structures.<sup>66</sup>

**Table 9-1. Common Water Rate Structures.<sup>67</sup>**

| Type of Rate Structure | Description  | Advantages  | Disadvantages   |
|------------------------|--|---|---|
| UNIFORM FLAT RATE      | <ul style="list-style-type: none"> <li>• Flat rate regardless of quantity used</li> <li>• Used in unmetered systems</li> </ul>   | <ul style="list-style-type: none"> <li>• No expense for installing and reading meters</li> </ul>  | <ul style="list-style-type: none"> <li>• All customers pay either too much or too little for what they use</li> <li>• Promotes high consumption.</li> </ul> |
| SINGLE BLOCK RATE      | <ul style="list-style-type: none"> <li>• Constant \$/gallon rate regardless of amount of water used.</li> <li>• Often coupled with a minimum charge for service availability.</li> </ul> | <ul style="list-style-type: none"> <li>• Easy to administer, may encourage water conservation.</li> <li>• Cost in direct proportion to amount used</li> </ul> | <ul style="list-style-type: none"> <li>• Can discourage high-usage industries from locating in the service area</li> </ul>                                  |

<sup>62</sup> [https://cwf.ca/wp-content/uploads/2015/11/CWF\\_ChargingForWaterUse\\_Report\\_JUL2011.pdf](https://cwf.ca/wp-content/uploads/2015/11/CWF_ChargingForWaterUse_Report_JUL2011.pdf)

<sup>63</sup> [https://cwf.ca/wp-content/uploads/2015/11/CWF\\_ChargingForWaterUse\\_Report\\_JUL2011.pdf](https://cwf.ca/wp-content/uploads/2015/11/CWF_ChargingForWaterUse_Report_JUL2011.pdf)

<sup>64</sup> <https://www.ola.org/en/legislative-business/bills/parliament-39/session-2/bill-13>

<sup>65</sup> <https://www.amo.on.ca/AMO-PDFs/Reports/2012/Guide-for-Municipal-Councils.aspx>

<sup>66</sup> [https://cwf.ca/wp-content/uploads/2015/11/CWF\\_WaterBackgrounder7\\_SEP2011.pdf](https://cwf.ca/wp-content/uploads/2015/11/CWF_WaterBackgrounder7_SEP2011.pdf)

<sup>67</sup> [https://www.in.gov/idem/cleanwater/files/rwsd\\_guide\\_measuring\\_nd\\_set\\_water\\_rates.pdf](https://www.in.gov/idem/cleanwater/files/rwsd_guide_measuring_nd_set_water_rates.pdf)

| Type of Rate Structure | Description   | Advantages   | Disadvantages  |
|------------------------|---|--|--|
| DECREASING BLOCK RATE  | <ul style="list-style-type: none"> <li>• \$/gallon price of successive “blocks” declines as consumption increases</li> <li>• Based on assumption that costs decline as consumption goes up</li> </ul>     | <ul style="list-style-type: none"> <li>• Attractive to large volume users.</li> </ul>  | <ul style="list-style-type: none"> <li>• Production costs may not decrease with increase in consumption</li> <li>• Low volume users may be subsidizing large volume users</li> </ul> |
| INCREASING BLOCK RATE  | <ul style="list-style-type: none"> <li>• \$/gallon price of successive “blocks” increases as consumption increases</li> <li>• Based on assumption that rates should promote water conservation</li> </ul> | <ul style="list-style-type: none"> <li>• Promotes water conservation.</li> <li>• Provides a reasonable amount at a reasonable price and charges a premium for those using more.</li> </ul> | <ul style="list-style-type: none"> <li>• Higher costs for high usage may discourage industry from locating in service area.</li> </ul>   |

### 9.3 Benchmarking Summary

The water industry in the U.S. is heavily regulated on the federal level by the EPA and on the state level by Public Utility Commissions. This infrastructure-intensive industry is a mix of public and private providers. Rates, that are set using a cost-of-service model, are fair, reasonable, non-discriminatory for all customers and allow cost recovery to sustain the business.. In contrast, Canadian regulation of water utilities has historically been lax. Water is often unmetered or priced using uniform rates that fail to recover costs and incentivize overconsumption. Recently, several provinces have implemented policy changes that are causing municipal utilities to adopt full cost-recovery through their rates.

## **APPENDIX A. LANDLINE TELEPHONE TAXES, FEES AND CHARGES IN THE U.S. <sup>68</sup>**

- **Basic local exchange service.** This is a flat-rate usage charge for basic dial-tone service.
- **9-1-1 charge.** This charge maintains the lines and database for 9-1-1 emergency services such as fire and rescue.
- **Federal excise tax.** This 3% tax is mandated by the federal government and imposed on all local calls. It is no longer imposed on long distance calls or wireless service.
- **(Federal) Subscriber line charge.** This charge mandated by the FCC helps cover the fixed cost of the local phone network, including lines and equipment from the central office to the customer. May appear as: "FCC charge for network access," "federal line cost charge," "interstate access charge," "federal access charge," "interstate single line charge," "customer line charge" or "FCC-approved customer line charge." This is a per-line charge and the FCC caps the maximum price a company may charge. Customers with multiple lines may pay a higher subscriber line charge.
- **(State) Subscriber line charge.** This charge maintains the local phone network. It may appear as "intrastate access fee" or "access recovery charge."
- **Local number portability charge (LPN).** This fixed monthly charge allows telephone companies to recover certain costs for providing residential and business telephone customers the ability to keep, at the same location, their existing local telephone numbers when they switch from one local telephone service provider to another.
- **State and local municipal tax.** This charge is placed by state, local and municipal governments on goods and services.
- **Universal service fund (USF)/Universal connectivity fee.** This federal fee helps to make phone service affordable and available to all Americans, including consumers with low incomes, schools, libraries, rural health care providers and those living in areas where the costs of providing telephone service is high.
- **Telecommunications Relay Service.** This charge helps pay for relay services that transmit and translate calls for people with hearing or speech disabilities.
- **Directory Assistance.** These charges may apply for placing 411 or (area code) 555-1212 directory assistance calls.
- **Monthly Calling Plan Charge.** This charge is applicable to any monthly calling plan such as unlimited long distance calling on your wireline bill or unlimited minutes on your wireless bill.

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<sup>68</sup> <https://www.puco.ohio.gov/be-informed/consumer-topics/understanding-your-landline-telephone-bill/>

- **Operator Assisted Calls.** This charge is for any calls connected by an operator. Rates for these calls generally are higher than rates for unassisted calls.
- **Minimum Monthly Charge.** This is a minimum monthly charge assessed by some long-distance companies even if you don't make long distance calls.

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<sup>69</sup> On October 11, 2019, Guidehouse LLP completed its previously announced acquisition of Navigant Consulting Inc. In the months ahead, we will be working to integrate the Guidehouse and Navigant businesses. In furtherance of that effort, we recently renamed Navigant Consulting Inc. as Guidehouse Inc.