

# The Socioeconomic Impact of the Keystone XL Pipeline on the State of Nebraska and Its Counties

Produced for:

TransCanada  
450 - 1 Street SW  
Calgary, Alberta, Canada  
T2P 5H1

February 13, 2017



**Goss & Associates**  
**The Goss Institute for Economic Research**  
**600 17th St., Suite 2800 South**  
**Denver, CO 80202-5428**  
**Principal Investigator: Ernie Goss, Ph.D.**  
**Phone: 402.280.4757**

# Table of Contents

## The Socioeconomic Impact of the Keystone XL Pipeline on the State of Nebraska and its Counties

Preface . . . . .	1
Glossary . . . . .	2
Executive Summary . . . . .	3
Chapter 1: Overview - The Keystone XL Pipeline In Nebraska . . . . .	8
Chapter 2: Direct Spending (Round One). . . . .	11
Chapter 3: Estimated Socioeconomic Impacts . . . . .	14
Appendix A: Discount Factors . . . . .	24
Appendix B: Measuring the Socioeconomic Impact of the Keystone XL Pipeline . . . . .	25
Appendix C: Choosing a Technique to Measure Impacts. . . . .	29
Appendix D: Details on Direct Spending . . . . .	31
Appendix E: Construction Camp. . . . .	34
Appendix F: Researcher's Biography. . . . .	35
Appendix G: Goss & Associates Research Consultancies, 2014 - Current . . . . .	36

# Preface

## The Socioeconomic Impact of the Keystone XL Pipeline on the State of Nebraska and its Counties

In the Fall of 2012, Goss & Associates completed an economic impact assessment of the Keystone XL pipeline on the State of Nebraska for the Consumer Energy Alliance (CEA). Due to the passage of time, TransCanada in 2017 requested that Goss & Associates update the 2012 study using more recent data. Specifically, the goal of this 2017 study is to update the socioeconomic impact of the Keystone XL pipeline on the Nebraska economy by using the most recent data and a timeline that is more in-line with the current construction and operations calendar.

Updated results differ from those in the 2012 analysis. The principal factors accounting for differentials in impacts between the two studies are:

1. The present study assumes that one-third of Nebraska workers will live in construction camps. The 2012 study assumed that all workers lived in public accommodations.
2. As the result of a significant decline in interest rates, the present study uses a lower discount rate than the 2012 study. Lowering the discount rate raises the estimated impacts.
3. Many variables changed between 2012 and 2017. For example, inflation rates, state and local tax rates, as well as multipliers have changed over the five-year period.
4. The time period for construction and operations changed.

Using input-output multipliers, the study provides sales, earnings and job impacts in addition to estimating the impact of the development on yearly state and local tax collections. This study, while funded by TransCanada, was developed independently of this organization. Any conclusions, findings, errors or mis-statements contained in this study are solely the responsibility of Goss & Associates, Economic Solutions.

Goss & Associates, Economic Solutions, LLC  
Principal Investigator: Ernie Goss, Ph.D.  
egoss@gossandassociates.com  
Senior Research Economist: Jeffrey Milewski  
jmilewski@gossandassociates.com

Goss & Associates  
600 17th Street, Suite 2800 South  
Denver, Colorado 80202-5428  
303.226.5882

[www.ernestgoss.com](http://www.ernestgoss.com)  
Department of Economics<sup>1</sup>  
Heider College of Business  
Creighton University  
Omaha, Nebraska 68178  
402.280.4757  
[www.outlook-economic.com](http://www.outlook-economic.com)

---

<sup>1</sup>Ernest Preston Goss, the principal investigator of this study, is the MacAllister Chair and professor of economics at Creighton University. This study was completed independent of Creighton University. As such, Creighton University bears no responsibility for findings or statements by Ernie Goss, or Goss & Associates, Economic Solutions.

# The Socioeconomic Impact of the Keystone XL Pipeline on the State of Nebraska and its Counties

Definition of Terms	
Term	Definition
Current dollars	Dollars not adjusted for inflation or discounted to 2015 dollars
Discounted	Unless stated otherwise, all financial data in this report are stated in dollars discounted to 2015 dollars
Direct effects	The set of expenditures applied to the predictive model for impact analysis.
IMPLAN	Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides an accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics which are specialized by region and can be used to measure the effect on a regional or local economy of a given change or event in the economy's activity. See Appendix C.
Input-output analysis	A type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy. More particularly, it measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands (U.S. Bureau of Economic Analysis).
Jobs supported	A job in IMPLAN = the annual average of monthly jobs in that industry. Thus, 1 job lasting 12 months = 2 jobs lasting 6 months, or = 3 jobs lasting 4 months each. A job can be either full-time or part-time.
Labor income	Wages & salaries plus self-employment income.
Overall or sales impacts	Amount of additional sales, including insurance premiums, retail sales, wholesale expenditures, construction sales, etc. It is analogous to gross domestic product (GDP), but will include some double counting and will thus exceed GDP.
Payroll	All forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees.
Private workers	All those working excluding government workers, state, local and federal.
Productivity	Growth in Gross Domestic Product (GDP) per worker.
Self-employment income	Income of proprietors of non-incorporated companies including attorneys, accountants and consultants.
Wages and salaries	The total payroll cost of the employee paid by the employer and for earnings for self-employed. Total payroll cost includes wages and salary, all benefits (e.g., health, retirement, etc) and employer-paid payroll taxes (e.g. employer side of social security, unemployment taxes, etc).

# Executive Summary

## The Socioeconomic Impact of the Keystone XL Pipeline on the State of Nebraska and Its Counties

Applying direct Nebraska spending by TransCanada between 2018 and 2034 to the Implan Multiplier System discussed in the Appendices of this study, Goss & Associates obtained impacts for Nebraska, the 12-county region, and each of the 12 Nebraska counties over which the pipeline crosses.<sup>2</sup>

Unless otherwise noted, all estimates are discounted to 2015 dollars. Estimates are provided for the construction phase 2018 - 20 and the operation period 2020 - 2034. In order to produce more conservative estimates, it is assumed that only 7.3 percent of TransCanada construction workers and their contractors are Nebraska residents.<sup>3</sup> Furthermore, the cost and installation of replacement materials over the operations period are not considered and it is assumed that all pipe, pump stations and terminals are produced outside of Nebraska. Additionally, estimates contained in this study do not include TransCanada pre-construction spending. Thus, estimates contained in this study are conservative, or below the impacts actually generated.

**Table EX.1: Summary of the impacts of Keystone XL on Nebraska, 2018-2034**

	Construction	Operations	2018-34
Sales/output	\$890,995,940	\$1,236,688,436	\$2,127,684,376
Jobs (average per year)	3,397.2	371.7	727.6
Labor income	\$326,558,356	\$415,471,634	\$742,029,990
State & local taxes	\$43,538,660	\$221,240,614	\$264,779,274

**Source: IMPLAN Multiplier System**

Additionally, estimates contained in this study do not include TransCanada pre-construction spending. Thus, estimates contained in this study are conservative, or below the impacts actually generated.

<sup>2</sup> Estimated direct TransCanada spending is listed in Tables D.1 – D.5 of Appendix D of this study.

<sup>3</sup>Goss and Associates.

# Executive Summary

## Construction Period, 2018 - 2020<sup>4</sup>

Between 2018 and 2020, the Keystone XL pipeline construction will have a significant positive impact on the Nebraska counties which it crosses. In 2015 dollars the impact will be:<sup>5</sup>

- State of Nebraska (see Table 3.1):
  - Total impact (output/sales): \$891.0 million.
  - Labor income (wages & salaries plus self-employment income): \$326.6 million.
  - Average jobs supported per year: 3,397.2.
- 12-county region that the pipeline crosses (see Table 3.4a):
  - Total impact (output/sales): \$42.6 million.
  - Labor income (wages & salaries plus self-employment income): \$15.6 million.
  - Average jobs supported per year: 162.4.
- Nebraska counties outside the region for the construction period:
  - Total impact (output/sales): \$848.4 million.
  - Labor income (wages & salaries plus self-employment income): \$311.0 million.
  - Average jobs supported per year: 3,234.8.

## Operation Period 2020 - 2034<sup>6</sup>

During the first 15 years of operation, 2020 to 2034, the Keystone XL pipeline will have a significant positive impact on the state, the region, and Nebraska counties which it crosses:

- State of Nebraska (see Table 3.1):
  - Total impact (output/sales): \$1.2 billion.
  - Labor income (wages & salaries plus self-employment income): \$415.5 million.
  - Average jobs supported per year: 371.7.
- 12-county region that the pipeline crosses (see Table 3.4b):
  - Total impact (output/sales): \$59.1 million.
  - Labor income (wages & salaries plus self-employment income): \$19.9 million.
  - Average jobs supported per year: 17.8.
- Nebraska counties outside the region of operations for the operations period:
  - Total impact (output/sales): \$1.2 billion.
  - Labor income (wages & salaries plus self-employment income): \$395.6 million.
  - Average jobs supported per year: 353.9.

<sup>4</sup>It is assumed that construction begins July 1, 2018 and ends June 30, 2020.

<sup>5</sup>Throughout this study, unless indicated otherwise, all financial values are expressed in dollars discounted to present value (2015).

<sup>6</sup>It is assumed that operations begin July 1, 2020. The 15-year period is used since that is the depreciable life of pipelines and equipment.

# Executive Summary

## State and Local Tax Impacts 2018 - 2034<sup>7</sup>

Between 2018 and 2034 construction and operations of the Keystone XL pipeline will contribute the following to state and local Nebraska taxes:

- State tax collections, all in 2015 dollars (see Table 3.6b):
  - Sales taxes: \$16.8 million (discounted).<sup>8</sup>
  - Use taxes: \$16.5 million (discounted).
  - Individual income taxes: \$14.6 million (discounted).
  - Corporate income taxes: \$2.7 million (discounted).
  - Other taxes & fees: \$10.8 million (discounted).
  - Total state taxes & fees: \$61.4 million (discounted).
- Local tax collections, all in 2015 dollars (see Table 3.6a)
  - Property taxes: \$203.2 million (discounted).<sup>9</sup>
  - Other taxes & fees: \$0.2 million (discounted).
  - Total local taxes & fees: \$203.4 million (discounted).

Impacts do not include TransCanada upfront payments



<sup>7</sup>Impacts do not include TransCanada upfront payments and activity.

<sup>8</sup>Sales taxes include local option sales taxes outside the 12-county area.

<sup>9</sup>Indirect property taxes are excluded.

# Executive Summary - Summary of Impacts

Figure EX.1: Property tax collections, 2018 - 2034 (discounted to 2017 dollars)

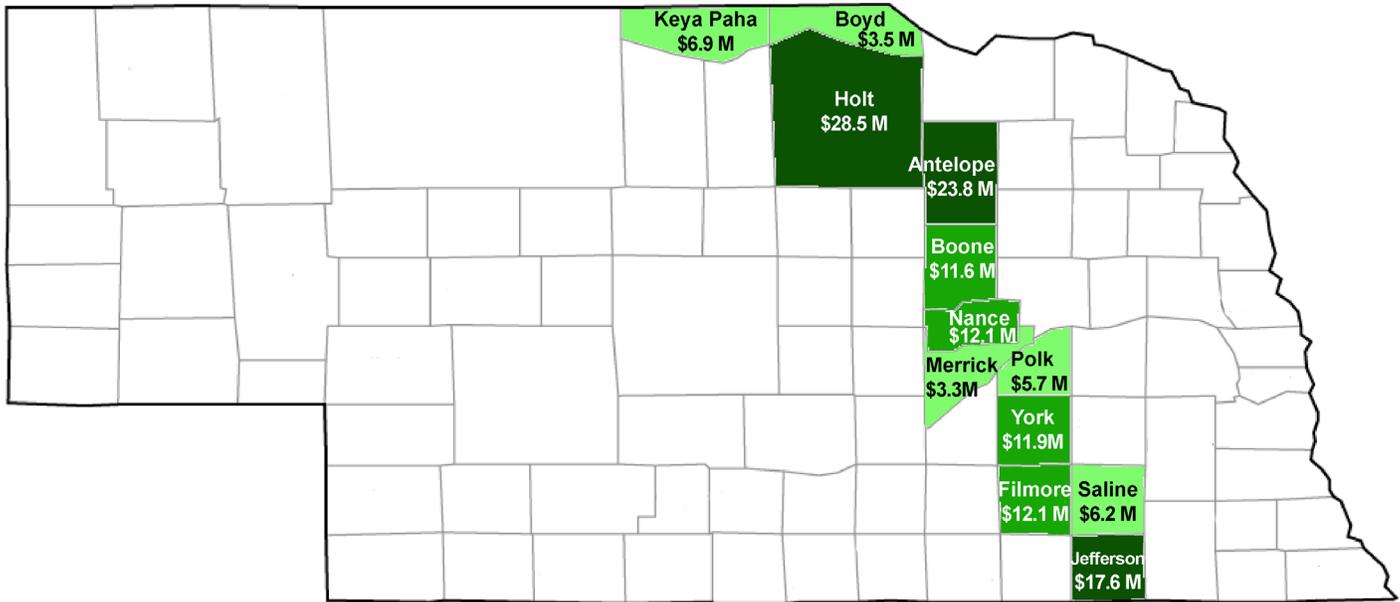
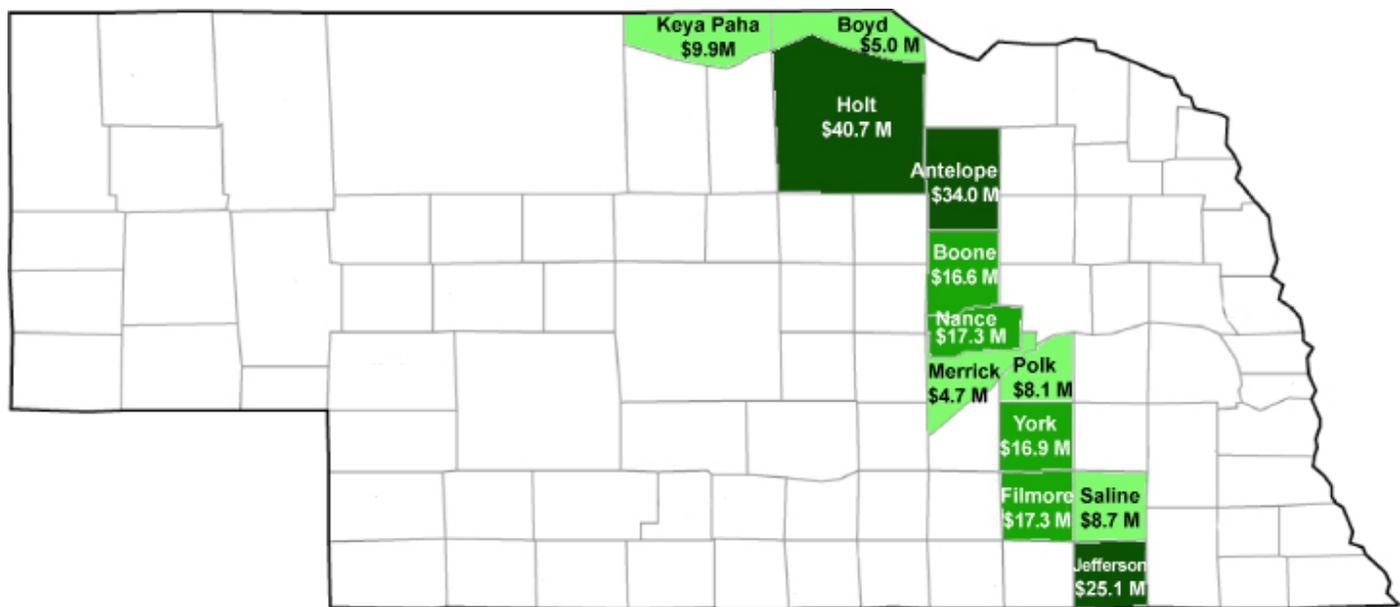


Figure EX.2: Property tax collections, 2018 - 2034 (2015 dollars)



## Other Estimated Impacts of the Keystone XL Pipeline

Keystone XL pipeline construction spending creates or supports additional spending as follows:

- Yearly, each \$1.0 million of Keystone XL pipeline *construction spending* creates \$286,522 of spillover impacts for a total Nebraska impact of \$1.29 million.<sup>10</sup>
- Yearly, each \$1 million of yearly Keystone XL pipeline *operations spending* creates \$0.15 million of spillover impacts for a total Nebraska impact of \$1.15 million.
- Yearly, each \$1 million of Keystone XL pipeline operations spending creates \$0.39 million in wages, salaries and self-employment income for Nebraska.

Keystone XL pipeline construction and operations will stimulate economic activity among Nebraska subcontractors and other Nebraska firms linked to energy and construction:

- In terms of jobs, construction of the Keystone XL pipeline in 2018 and 2019 will support:<sup>11</sup>
  - o A yearly average of 387.1 jobs in Nebraska firms supporting oil and gas operations.
  - o A yearly average of 320.6 jobs in Nebraska business support services firms.
  - o A yearly average of 282.3 jobs in Nebraska construction firms.



- In terms of overall economic activity, or sales, construction of the Keystone XL pipeline in 2018 and 2019 will support:
  - o Approximately \$174.5 million for Nebraska firms supporting oil and gas operations.
  - o More than \$90.3 million for Nebraska construction firms.
  - o More than \$64.2 million for Nebraska architectural and engineering services firms.

<sup>10</sup> This number could potentially grow in years ahead as TransCanada purchases a portion of its replacement pipeline, pump stations and terminals in Nebraska. In this study, it is assumed that 50 percent of these products are purchased outside the U.S. and 50 percent purchased inside the U.S., but outside of Nebraska.

<sup>11</sup> Data for 2019 is for the period July 1, 2019 to June 30, 2020.

# Chapter 1: Overview-

## The Keystone XL Pipeline in Nebraska

### Introduction

TransCanada's Keystone XL project is a proposed extension of the existing Keystone Pipeline System that will consist of an 1,205-mile crude oil pipeline and related facilities that would be used largely to connect Canada's crude oil from a supply hub in Hardisty, Alberta to Steele City, Nebraska for eventual transport to refineries on the Gulf of Mexico in Texas.<sup>12</sup> The Northern pipeline could transport up to 830,000 barrels per day and is estimated to cost approximately \$8.02 billion.

After its application was rejected by the United States State Department in January 2012,<sup>13</sup> and due to concerns regarding the route across the Sand Hills region of Nebraska, TransCanada provided a new application with a different route that avoids the areas of concern and is awaiting approval. If permitted, Keystone XL could begin construction in 2018.<sup>14</sup>

Keystone XL has generated much debate surrounding issues of pipeline safety, effect on gasoline prices, energy independence (from unstable regions of the world), environment and ecology, and economic impacts. The economic impact is the focus of this study with the goal being to gauge the impact that the construction and operations of Keystone XL would have on the state and local economies of Nebraska.

A significant effect of the Keystone XL project would be the generation of economic activity. That activity would consist of:

- Sales or output total - Amount of additional sales, including insurance premiums, retail sales, wholesale expenditures, construction sales, etc. It is analogous to gross domestic product (GDP), but will include some double counting and will thus exceed GDP; both direct and multiplier effects.
- Wages and salaries - the income of Nebraska's workers – including those self-employed; both direct and multiplier effects.
- Jobs – construction and spin-off jobs from the pipeline's construction, operation, and maintenance; both direct and multiplier effects
- Tax revenues – to the state and to the local economies; both direct and multiplier effects.

While each of these impacts will be examined in detail in the chapters that follow, the tax implications of the current Keystone pipeline (not Keystone XL) have been visible in Nebraska's news. Nebraska's valuation of the Keystone pipeline (not Keystone XL) has more than tripled to \$466.0 million from \$145.3 million in 2011. Keystone construction was completed in 2014.

Applying an average personal property tax rate of \$1.8 per \$100 of assessed value yields estimated property taxes of \$8.4 million for 2016 assuming no local property tax lids.

While the impact to rural schools and counties could be limited due to spending lids placed on local governments and state aid to schools laws, the additional revenue will benefit individual taxpayers, particularly farmers, by shifting the general property tax load away from them and to TransCanada.

<sup>12</sup><http://www.transcanada.com/keystone.html>.

<sup>13</sup><http://www.state.gov/r/pa/prs/ps/2012/01/181473.htm>

<sup>14</sup>For this study, it is assumed that construction of the Keystone XL pipeline will be completed by the end of June 30, 2020 with operations beginning July 1, 2020.

## Chapter 1: The Keystone XL Pipeline in Nebraska

Based on the 2011 valuation for the previously-constructed Keystone Pipeline, TransCanada paid \$2.2 million in Nebraska property taxes in 2012 and the company estimates they paid approximately \$8.5 million in 2013. All of the valuation attributable to the pipeline is categorized as personal property, and by state law such personal property is depreciated over 15 years at which time it is fully depreciated.<sup>15</sup> The amount of tax revenue that will be generated by the Keystone XL project is uncertain, but it is safe to assume it will produce more in tax benefits than the first pipeline, because it will be larger (a 36-inch pipe versus a 30-inch pipe). Additionally, the length across Nebraska per current estimates is 275.17 miles (versus original estimate of 215 miles).<sup>16</sup>

### Keystone XL Pipeline by Nebraska County

Figure 1.1 shows the revised path by county that the pipeline will take across Nebraska. The new route will span 275.17 miles.

Figure 1.1: Nebraska path of Keystone pipeline by county, 2017



Table 1.1 lists the Nebraska counties which the pipeline will cross from the northern entry county of Keya Paha to the southern exit county of Jefferson. As listed, Holt County will receive the largest total capital investment. In terms of pipeline services costs, Holt County also is highest among the Nebraska counties. Additionally, Holt County will host the Nebraska construction camp.

However, the impacts will not be limited to these counties since Keystone XL pipeline workers and TransCanada will spend a significant portion of overall expenditures in other Nebraska counties. Furthermore, many Keystone XL vendors will reside outside the construction counties, but in Nebraska. Currently, it is expected that 50 percent of pipeline will be produced in Canada and 50 percent in Arkansas. It will be assumed by this study that none of the pipeline, pump stations or terminals will be produced in Nebraska during the period 2018-2034.

<sup>15</sup><http://www.omaha.com/article/20120814/NEWS/120819881/1707>

<sup>16</sup>TransCanada

## Chapter 1: The Keystone XL Pipeline in Nebraska

**Table 1.1: Pipeline material costs and labor costs by Nebraska county (pipeline, pump station, sales tax)**

	Material costs	Labor Costs
Keya Paha (northernmost county)	\$14,759,232	\$37,694,803
Boyd	\$7,544,245	\$19,267,860
Holt	\$64,996,376	\$150,326,846
Antelope	\$55,050,141	\$124,924,347
Boone	\$24,830,808	\$63,417,419
Nance	\$29,936,107	\$60,783,575
Merrick	\$7,008,041	\$17,898,406
Polk	\$12,126,979	\$30,972,076
York	\$25,299,739	\$64,615,060
Fillmore	\$29,904,271	\$60,702,267
Saline	\$13,031,012	\$33,280,960
Jefferson (southernmost county)	\$41,760,613	\$90,983,141
<b>Total for Nebraska</b>	<b>\$326,247,564</b>	<b>\$754,866,760</b>

Source: TransCanada

### Summary

The estimation methodology assumes that impacts by county from spending listed in Table 1.1 will be reduced by the employment of workers from outside Nebraska along with pipeline and associated materials manufactured outside the state. The impacts presented in subsequent chapters are nevertheless quite significant. Furthermore, property taxes will be paid based on the installed cost, and Nebraska use taxes will be paid on materials produced in other states.

Furthermore, property taxes will be paid based on the installed cost, and Nebraska use taxes will be paid on materials produced in other states.

## Chapter 2: Direct Spending (Round One)

### Construction

As a starting point, Goss & Associates estimates the direct spending related to the Keystone XL pipeline construction and operations. The U.S. State Department estimates that roughly 10 percent of the jobs generated due to construction of the Keystone XL pipeline are hired locally.<sup>17</sup> In the analysis that follows, it is assumed that \$196.7 million of the \$2.7 billion in total labor costs for the northern portion of Keystone XL during the construction phase will be paid to Nebraska workers.

Table D.3 lists the expected wages and salaries directly spent by TransCanada in the three states: Montana, Nebraska and South Dakota. Column 1 shows total Keystone XL labor costs for the two-year construction period. Column 2 lists the share of the workers that are expected to be Nebraska residents. Column 3 in Table D.3 lists the total wages and salaries of \$196.7 million that are expected to be paid to workers that are Nebraska residents.

Of course, a large share of the direct jobs created by the pipeline will be filled by non-Nebraskans. A Cornell study that examined the expected Keystone XL construction activity concluded that it is likely that only 11.0 percent of Keystone XL pipeline workers would be residents of Nebraska. This study will use an even more conservative 10.0 percent value.

A Cornell study that examined the expected Keystone XL construction activity concluded that it is likely that only 11.0 percent of Keystone XL pipeline workers would be residents of Nebraska. This study will use an even more conservative 10.0 percent

That is, this study will assume that 10.0 percent of pipeline workers in Nebraska will be Nebraska residents. However, it is also likely that a share of Keystone XL pipeline workers in Montana and South Dakota will also be Nebraska residents.

This study assumes that Nebraska workers will represent the same share of the direct workers in Montana and South Dakota that they represent in area construction trades.<sup>18</sup> In 2010, Nebraska workers represented 6.1 percent of the construction and extraction occupations in the total area.

To summarize, it is assumed that of the Keystone XL pipeline workers in the northern portion of the pipeline: 10.0 percent of Nebraska workers will be Nebraska residents, 6.1 percent of Montana workers will be Nebraska residents, and 6.1 percent of South Dakota workers will be Nebraska residents. This means that it is assumed that 7.3 percent of all workers in the northern portion of the Keystone XL pipeline construction will be Nebraska workers with an estimated payroll of \$196.7 million for the two-year period (Column 3 of Table D.3).

This means that it is assumed that 7.3 percent of all workers in the northern portion of the Keystone XL pipeline construction will be Nebraska workers with an estimated payroll of \$196.7 million for the two-year period.

<sup>17</sup>US State Department's Final Environmental Impact Statement (FEIS), Socioeconomics, Section. 3.10-57. <http://www.keystonepipeline-xl.state.gov/clientsite/keystonexl.nsf?Open>.

<sup>18</sup>This study assumes that workers will come from the following states: Colorado, Iowa, Kansas, Missouri, Montana, North Dakota, Oklahoma, Minnesota, and South Dakota.

## Chapter 2: Direct Spending (Round One)

As listed, in Table 2.1 TransCanada is expected to spend approximately \$71.6 million for land rights in Nebraska. This value includes the direct purchase of land, easements and the value of crop losses due to the construction phase of the Keystone XL pipeline. Pipeline services costs include spending for regulatory requirements, including permitting, environmental and safety requirements, community relations, engineering, surveying, construction management, inspections, power infrastructure, commissioning, and pre-operations.<sup>19</sup>

It is assumed that 100 percent of pipelines and pump stations are purchased from businesses located outside of Nebraska.

	Total NE
Services spending (details Table D.1, Appendix D)	\$422,845,840
Land purchases, easements and crop damage (details Table D.2)	\$73,044,094
Labor spending (details Table D.3)	\$196,671,507
Other costs (details Table D.4)	\$30,014,443
<b>Total</b>	<b>\$722,575,884</b>

**Source: TransCanada**

It is assumed that 100 percent of pipelines and pump stations are purchased from businesses located outside of Nebraska. A total of \$722.6 million in spending related to the construction of Nebraska's pipeline is expected to be made to Nebraska individuals and businesses.

A total of \$722.6 million in direct project spending is expected within the borders of Nebraska in 2018 and 2019.<sup>20</sup> Details of this spending is provided in Tables D.1 through D.4 in Appendix D.

<sup>19</sup>Percent spent in Nebraska: regulatory, including permitting (50%), environmental (2.5%), safety (2.5%), community relations (\$5 million), power infrastructure (100%), commissioning (10%), and pre-operations (10%).

<sup>20</sup>2019 construction runs from July 1, 2019 to June 30, 2020.

## Chapter 2: Direct Spending (Round One)

### Operations Phase

**Materials and personnel.** As displayed in Table 2.2, during the Keystone XL pipeline operations phase from 2020 to 2034, TransCanada is estimated to spend \$1,078,126,791 on salaries, benefits, maintenance, freight, vehicles, office expenses and other costs. This expected spending is based on TransCanada spending for 2014 on the Keystone pipeline in Nebraska. In 2014, TransCanada spent \$28,092,487 on the 217.4 miles of Keystone Nebraska pipeline. This represents 2020 spending of \$160,077 per mile. Using this spending per mile of pipeline, and including property tax, Nebraska spending for Keystone XL pipeline would be \$47,545,050 (1/2 year) for 2020.<sup>21</sup>

**Table 2.2: Total Nebraska direct spending for operations July 2020-July 2035 (2015 dollars)**

Year	Direct Spending (not discounted)
2020	\$47,545,050
2021	\$69,468,395
2022	\$69,425,637
2023	\$69,443,145
2024	\$69,523,108
2025	\$69,667,794
2026	\$69,879,557
2027	\$70,160,833
2028	\$70,514,148
2029	\$70,942,119
2030	\$71,447,459
2031	\$72,032,979
2032	\$72,701,593
2033	\$73,456,319
2034	\$74,300,286
2035	\$37,618,369
<b>Total</b>	<b>\$1,078,126,791</b>

Source: Goss & Associates

<sup>21</sup>In 2020, this represents \$160,077 per Nebraska Keystone XL mile plus property tax payments. For each year in Table 2.2, spending is for the period July 1 to June 30 of the next year.

## Introduction

The expenditures of Keystone XL, its workers, contractors and vendors provide a source of jobs and income for residents of the state and counties through which it crosses. This spending for locally-supplied goods and services produces a first round of impacts.

This initial spending leads to further spending, with a resultant impact that is a multiple of “first round” spending. Thus, the impact of Keystone XL continues after the initial money is spent for goods and services. It supports many enterprises and individuals indirectly linked to the pipeline, such as residential housing, retail, restaurant, and hotel sectors.

Based on 2018 to 2034 spending listed in Tables 2.1 and 2.2, the task is to estimate the economic impact of these outlays of Keystone XL. Using input-output multipliers, the study provides sales, earnings and job impacts in addition to estimating the impact of the initial spending on state and local tax collections.

Input-output multipliers show how spending initiated in one industry or several industries is filtered throughout the local and state economies. For each dollar generated by Keystone XL, there are direct effects for the initial spending plus the spillover impacts into the rest of the Nebraska economy.

Input-output multiplier models are the most frequently-used type of analysis tool for economic impact assessment. Input-output analysis assumes that each sector purchases products and services from other sectors and then sells its output to other sectors and/or final consumers. The multiplier system that will be used is IMPLAN.<sup>22</sup> This is a widely-used and accepted methodology and is described in more detail in the accompanying appendices.



This initial spending leads to further spending, with a resultant impact that is a multiple of “first round” spending.

<sup>22</sup>The IMPLAN Software. IMPLAN (Impact Analyses and Planning) is a computer software package that consists of procedures for estimating local input-output models. The U.S. Forest Service, in cooperation with the Federal Emergency Management Agency and the U.S. Bureau of Land Management originally developed IMPLAN to assist in land and resource management planning. Since 1993, the Minnesota IMPLAN Group Inc. in Stillwater, Minnesota with exclusive rights has continued development and maintenance of the IMPLAN system. This group licenses and distributes the software to users. IMPLAN is one of the most widely used and accepted software packages for impact assessment. Goss & Associates is a licensed user of IMPLAN.

## Chapter 3: Estimated Socioeconomic Impacts

In tailoring the IMPLAN model for Keystone XL spending, Goss & Associates used conservative assumptions. Impacts were calculated for five categories that reflect the contribution of Keystone XL to the state and local economy:

1. Output-contribution to overall economic activity.
2. Value added or gross domestic product.
3. Employment-contribution to the job base.
4. Labor income- the sum of wages, salaries and self-employment income.
5. Taxes-contribution to state and local tax collections.

Impacts are estimated for the State of Nebraska, the counties through which the pipeline passes and individual industries. The results presented in this study are generated for the period 2018 - 2034. All estimates listed in this chapter are in 2015 dollars. Appendix A lists discount rates and factors used throughout this study.

### Total Impact on Nebraska Economic Activity

The first step in measuring impacts was to input Keystone XL direct spending from Table 2.1 into the IMPLAN Multiplier System. Table 3.1 summarizes total impacts between 2018 and 2034. As listed, the initial spending from 2018-19<sup>23</sup> will generate almost \$891.0 million in output, or sales, and \$326.6 million in labor income. Almost \$2.1 billion in output, or sales, and \$0.7 billion in labor income will be generated from 2018-34, and an average of 727.6 jobs per year will be supported for the period.<sup>24</sup>

**Table 3.1: Impact of Keystone XL on Nebraska Economy, 2018- 2034 (discounted to 2015 dollars)**

	Construction 2018-19	Operations 2020-34	2018-34
Output	\$890,995,940	\$1,236,688,436	\$2,127,684,376
Jobs (average) per year	3,397.2	371.7	727.6
Labor income	\$326,558,356	\$415,471,634	\$742,029,990

Source: IMPLAN Multiplier System

<sup>23</sup>Impacts for 2019 are for the period July 1, 2019 to June 30, 2020.

<sup>24</sup>For 2021, TransCanada spending for electric power is estimated to be \$35.2 million, for property taxes is estimated to be \$21.8 million (direct and indirect and induced) and for pipeline support is \$5.8 million.

## Chapter 3: Estimated Socioeconomic Impacts

In sales or output, the impact of Keystone XL on the economy was \$2,127,684,374 with the breakdown by year contained in Table 3.2.

<b>Table 3.2: Impact of Keystone XL on state of Nebraska output, 2018 - 2035 (discounted to 2015 dollars)</b>			
Year	Total	Labor income	Jobs (average per year)
2018	\$494,516,390	\$177,587,209	3,784.1
2019	\$396,479,550	\$148,971,147	3,010.2
2020	\$70,521,484	\$22,012,944	347.2
2021	\$95,592,734	\$31,104,696	448.6
2022	\$92,969,203	\$30,415,167	433.4
2023	\$90,483,962	\$29,766,068	419.0
2024	\$88,133,671	\$29,156,461	405.2
2025	\$85,893,578	\$28,578,946	392.1
2026	\$83,825,045	\$28,052,102	379.8
2027	\$81,860,499	\$27,555,605	368.1
2028	\$80,018,468	\$27,095,110	357.0
2029	\$78,296,072	\$26,669,810	346.6
2030	\$76,690,512	\$26,278,923	336.8
2031	\$73,861,298	\$25,460,548	321.7
2032	\$71,216,031	\$24,694,730	307.6
2033	\$68,744,730	\$23,978,620	294.5
2034	\$66,437,895	\$23,309,503	282.3
2035	\$32,143,252	\$11,342,401	135.4
<b>Total</b>	<b>\$2,127,684,374</b>	<b>\$742,029,990</b>	<b>727.6</b>

**Source: IMPLAN Multiplier System**

## Chapter 3: Estimated Socioeconomic Impacts

### Impacts for 12-County Region

The number of jobs created in conjunction with Keystone XL development for each year from 2018 to 2034, an average of 34.8, direct, indirect, and induced impacts per year is presented in Table 3.3.

**Table 3.3: Impact of Keystone XL on 12-county region, 2018-34 (discounted to 2015 dollars)**

	Construction 2018-19	Operations 2020-34	Total 2018-34
Output	\$42,595,476	\$59,121,855	\$101,717,331
Jobs (average per year)	162.4	17.8	34.8
Labor income	\$15,611,641	\$19,862,282	\$35,473,923

Source: Goss & Associates estimates from IMPLAN

Table 3.4a lists total impacts of Keystone XL as well as wages & salaries and average jobs supported for the 12 Nebraska counties for the construction period and Table 3.4b lists impacts for the operations period 2020-34.

**Table 3.4a: Impacts of Keystone XL on 12-county region for construction period (discounted to 2015 dollars)**

County	Total output	Labor income	Average jobs
Antelope	\$3,528,003	\$1,293,046	13.5
Boone	\$2,963,201	\$1,086,041	11.3
Boyd	\$1,154,223	\$423,034	4.4
Fillmore	\$3,140,737	\$1,151,110	12.0
Holt	\$5,468,594	\$2,004,291	20.9
Jefferson	\$3,945,095	\$1,445,914	15.0
Keya Paha	\$465,382	\$170,567	1.8
Merrick	\$3,884,023	\$1,423,531	14.8
Nance	\$1,911,712	\$700,660	7.3
Polk	\$2,669,674	\$978,460	10.2
Saline	\$6,553,696	\$2,401,991	25.0
York	\$6,911,136	\$2,532,996	26.4
Total	\$42,595,476	\$15,611,641	162.4

Source: Goss & Associates from IMPLAN

## Chapter 3: Estimated Socioeconomic Impacts

**Table 3.4b: Impacts of Keystone XL on 12-county region for operation period (discounted to 2015 dollars)**

County	Total output	Labor income	Average jobs
Antelope	\$4,896,813	\$1,645,109	1.5
Boone	\$4,112,876	\$1,381,741	1.2
Boyd	\$1,602,044	\$538,215	0.5
Fillmore	\$4,359,294	\$1,464,526	1.3
Holt	\$7,590,323	\$2,550,007	2.3
Jefferson	\$5,475,730	\$1,839,599	1.6
Keya Paha	\$645,943	\$217,008	0.2
Merrick	\$5,390,963	\$1,811,121	1.6
Nance	\$2,653,426	\$891,432	0.8
Polk	\$3,705,466	\$1,244,870	1.1
Saline	\$9,096,428	\$3,055,990	2.7
York	\$9,592,549	\$3,222,665	2.9
<b>Total</b>	<b>\$59,121,855</b>	<b>\$19,862,282</b>	<b>17.8</b>

Source: Goss & Associates from IMPLAN

## Chapter 3: Estimated Socioeconomic Impacts

### Impacts by Nebraska Industry

Table 3.5 lists the top ten impact industries for the state for the construction period July 1, 2018 to June 30, 2020. As presented, firms in support activities for oil and gas operations experience the largest impact for the two-year construction period at approximately \$174.5 million.

**Table 3.5: Top ten impact industries for Nebraska, construction period discounted to 2015 dollars, 2018-20**

Industry	Average jobs	Labor income	Total impact (output)
Support activities for oil and gas operations	387.1	\$57,143,199	\$174,519,685
Construction of other new residential structures	282.3	\$23,905,637	\$90,342,180
Architectural, engineering, and related services	240.1	\$36,282,018	\$64,202,856
Electric power generation, transmission, and distribution	20.9	\$11,500,981	\$46,776,399
Business support services	320.6	\$20,874,085	\$37,515,937
Environmental and other technical consulting services	124.5	\$13,869,258	\$22,883,346
Monetary authorities and depository credit intermediation activities	32.8	\$3,077,057	\$22,117,113
Insurance agencies, brokerages, and related activities	103.1	\$12,449,031	\$21,789,422
Commercial and industrial machinery and equipment repair and maintenance	145.1	\$13,430,911	\$19,661,500
Securities, commodity contracts, investments, and related activities	117.3	\$5,371,009	\$19,545,238
All other industries	1,623.6	\$128,655,170	\$371,642,264
Total all industries	3,397.2	\$326,558,356	\$890,995,940

Source: Goss & Associates estimates from IMPLAN

## Chapter 3: Estimated Socioeconomic Impacts

### Impact on State and Local Tax Collections

Not only do Keystone XL vendors pay taxes on profits, their employees, residents and vendors, as well as businesses tied to these groups, pay state and local taxes. Table 3.6a and 3.6b provide details on state and local tax collections, Table 3.7 lists the impacts on property taxes in both current dollars, and Table 3.8 lists the impacts on property taxes in both current and discounted dollars.

**Property taxes.** TransCanada will be required to pay personal property taxes on the pipeline for the first 15 years of operations. It is assumed that taxes are paid on the installed costs with the pipeline fully depreciated after 15 years of operations. These estimates assume that there are no major capital improvements to the pipelines that increase the value of the pipeline and property taxes.

Nebraska adjusted basis for property taxes is the company's federal basis. Generally it is the cost of the item, including sales tax, freight, installation, testing charges, and other fees or taxes associated with the acquisition of the property. The state will assess the pipeline when it is operational. In this study, it is assumed that the pipeline will be operational on July 1, 2020. If the pipeline owns any property in the state which has been placed into service for federal tax purposes prior to being operational, that property is subject to local assessment. If it becomes operational in the middle of the year, then it is locally assessed for that year and transfers to state assessment the following year. The actual rate that it will be taxed is the actual local consolidated rate.<sup>25</sup>

**Table 3.6a: Local tax collections, 2018-34 (discounted to 2015 dollars)**

County	Property taxes	Other taxes & fees	Total local taxes & fees
Antelope	\$23,768,699	\$14,746	\$23,783,445
Boone	\$11,583,809	\$12,385	\$11,596,194
Boyd	\$3,519,462	\$4,824	\$3,524,286
Fillmore	\$12,037,911	\$13,127	\$12,051,038
Holt	\$28,408,713	\$22,857	\$28,431,570
Jefferson	\$17,569,007	\$16,489	\$17,585,496
Keya Paha	\$6,885,323	\$1,945	\$6,887,268
Merrick	\$3,269,318	\$16,234	\$3,285,552
Nance	\$12,052,763	\$7,990	\$12,060,753
Polk	\$5,657,351	\$11,158	\$5,668,509
Saline	\$6,079,091	\$27,392	\$6,106,483
York	\$11,802,570	\$28,886	\$11,831,456
Total - 12-county area	\$142,634,017	\$178,034	\$142,812,051
Nebraska outside 12-county area	\$60,606,608	n.a.	\$60,606,608
Total local taxes	\$203,240,625	\$178,034	\$203,418,659

Source: Goss & Associates; IMPLAN Multipliers

<sup>25</sup>As a rough estimate, since pipelines are in the rural areas more than cities, the average levy is more like \$1.8 per \$100 of assessed value. The overall average state levy is closer to 1.95." (Nebraska Department of Revenue official). TransCanada will also pay property taxes on any significant replacements or upgrades. The impacts of these replacements/upgrades are not included here.

## Chapter 3: Estimated Socioeconomic Impacts

**Table 3.6b: State tax collections, 2018-34**

State summary	Discounted to 2015 dollars
Sales taxes	\$16,770,952
Use taxes on pipeline and pump stations	\$16,452,088
Individual income taxes	\$14,619,088
Corporate income taxes	\$2,738,968
Other taxes & fees	\$10,779,519
<b>Total state taxes &amp; fees</b>	<b>\$61,360,615</b>

Source: Goss & Associates; IMPLAN Multipliers

**Table 3.7: Local tax collections in 12-county area, 2018-34 (current dollars--not discounted)**

County	Property taxes (includes direct and indirect)	Other taxes & fees	Total local taxes
Antelope	\$34,022,520	\$18,863	\$34,041,383
Boone	\$16,581,066	\$15,843	\$16,596,909
Boyd	\$5,037,759	\$6,171	\$5,043,930
Fillmore	\$17,231,068	\$16,793	\$17,247,861
Holt	\$40,664,237	\$29,239	\$40,693,476
Jefferson	\$25,148,280	\$21,093	\$25,169,373
Keya Paha	\$9,855,652	\$2,488	\$9,858,140
Merrick	\$4,679,703	\$20,767	\$4,700,470
Nance	\$17,252,327	\$10,221	\$17,262,548
Polk	\$8,097,934	\$14,274	\$8,112,208
Saline	\$8,701,613	\$35,041	\$8,736,654
York	\$16,894,201	\$36,952	\$16,931,153
<b>Total</b>	<b>\$204,166,359</b>	<b>\$227,747</b>	<b>\$204,394,106</b>

Source: Goss & Associates; IMPLAN Multipliers

## Chapter 3: Estimated Socioeconomic Impacts

**Table 3.8: Property taxes by county in 12-county area, total 2018-34**

County	Total current dollars	Total discounted to 2015 dollars
Antelope	\$34,022,520	\$23,768,699
Boone	\$16,581,066	\$11,583,809
Boyd	\$5,037,759	\$3,519,462
Fillmore	\$17,231,068	\$12,037,911
Holt	\$40,664,237	\$28,408,713
Jefferson	\$25,148,280	\$17,569,007
Keya Paha	\$9,855,652	\$6,885,323
Merrick	\$4,679,703	\$3,269,318
Nance	\$17,252,327	\$12,052,763
Polk	\$8,097,934	\$5,657,351
Saline	\$8,701,613	\$6,079,091
York	\$16,894,201	\$11,802,570
<b>Total Property taxes</b>	<b>\$204,166,359</b>	<b>\$142,634,016</b>

Source: Goss & Associates

### Summary

This study has detailed the impacts of construction and operation of the Keystone XL pipeline in Nebraska. The impacts presented are conservative in the sense that it is assumed that 1) only 10.0 percent of the workers installing and constructing the Nebraska pipeline are Nebraska residents; 2) all estimates are discounted to present value; 3) none of the pipe, pumps or terminals are produced in Nebraska; 4) additionally, the economic impacts of significant pipeline or pump station replacements over the period 2020-34 are not included.

As a result of these conservative assumptions, the economic impacts in this study are lower than the impacts that will ultimately be experienced.

# Appendices

# Appendix A: Discount Factors

Table A.1 lists discount factors for the period 2020 – 2034. Goss & Associates uses the average yield for 10-year U.S. Treasury bonds over the past fifteen years from 2000 to 2015. The average yield was 3.88 percent over the period.

**Table A.1: Discount factor by year, 2020-34**

Period	Year	Discount factor
1	2020	1.21
2	2021	1.26
3	2022	1.31
4	2023	1.36
5	2024	1.41
6	2025	1.46
7	2026	1.52
8	2027	1.58
9	2028	1.64
10	2029	1.70
11	2030	1.77
12	2031	1.84
13	2032	1.91
14	2033	1.98
15	2034	2.06

**Source: Based on the average yield on 10-year U.S. Treasury bonds over the past 15 years**

# Appendix B: Measuring the Socioeconomic Impact of the XL Pipeline

According to the previous estimates, the development of the Keystone XL pipeline will be an important stimulus of economic growth for the state of Nebraska and the counties through which it crosses. Furthermore, Keystone XL vendors contribute to the economy through their own employment and payroll, and through purchases from their own vendors. Payments to these vendors are an important source of growth for the state economy. Thus, the Keystone XL pipeline produces benefits for the Nebraska taxpayer, both directly and indirectly.

...direct benefits for the Nebraska taxpayer include the receipt of sales taxes on purchases by Keystone XL workers.

As a result of the widespread distribution of construction and operations of the Keystone XL pipeline, the pipeline will influence the state's economy in many ways. As discussed earlier, the presence of Keystone XL increases the spending by non-Nebraska residents in Nebraska. Furthermore, construction and operations of the pipeline, in the long run, encourages the startup and/or relocation of retail businesses and manufacturing firms to the state. Access to Keystone XL jobs increases employment opportunities and assists the state in retaining and attracting individuals to the state, thereby helping to create "brain gain."<sup>26</sup>

In addition to these growth dynamics, there also is economic activity related to the direct expenditures by Keystone XL vendors, such as payroll, local jobs and income.

...the Keystone XL pipeline contributes to Nebraska's economy by encouraging businesses, residents, and visitors to purchase in the state.

Furthermore, Keystone XL indirectly affects the overall level of the state's economic activity. For example, the office supplies industry provides jobs and income for workers in the area as a result of TransCanada spending on computers, pens and paper related to Keystone XL.

Large portions of Keystone XL spending are made in the state economy. That portion spent locally adds to the state's income. Economic impacts that take place outside the state economy, for example spending in Kansas, are called outflows and reduce overall impacts. They are excluded when estimating economic impacts of the local area.

Additionally, Keystone XL increases retail sales in the state as employees and visitors who reside outside Nebraska spend a portion of their wages in the state. In other words, Keystone XL contributes to the region's export of retail goods. These sales have a positive impact on the state by adding jobs and income in retail and related industries. Figure B.1 demonstrates the four components of the total economic impact: 1) the Direct Economic Impact, 2) the Indirect Economic Impact, 3) the Induced Economic Impact, and 4) Outflows. Each is defined on the following page.

<sup>26</sup>In 1995, the Federal Reserve Bank of Kansas City estimated that the state of Nebraska loses over \$246 million per year as a result of the net out-migration of college educated workers (termed "brain drain").

## Appendix B: Measuring the Socioeconomic Impact of the XL Pipeline

### Direct Economic Impacts

Keystone XL spending flowing into the area has direct economic effects on the local economy via expenditures for goods and services and for employee salaries. The most obvious direct expenditures are payment of wages to Nebraska workers employed by Keystone XL. In addition, expenditures non-Nebraska Keystone XL workers employed in the state generate direct impacts on the state affecting primarily retail trade and accommodation Industries. Direct economic impacts are color coded green in Figure B.1.

### Indirect Economic Impacts

Keystone XL also produces indirect economic effects on the area economy. For example, Keystone XL contractors will purchase supplies from area wholesalers. Furthermore, Keystone XL encourages the startup and expansion of other businesses. Keystone XL generates indirect effects by increasing: (a) the number of firms drawn to the state, (b) the volume of deposits in the state's financial institutions and, (c) economic development. Examples of indirect economic impacts are color coded blue on Figure B.1.

### Induced Economic Impacts

Induced impacts in the region occur as the initial spending feeds back to industries in the region when workers in the state purchase additional output from local firms in a second round of spending. That is, Keystone XL increases overall area income and population, which produces another round of increased spending adding to sales, earnings and jobs. Examples of induced economic impacts are color coded red in Figure B.1.

### Outflows

Outflows represent spending linked to the Nebraska portion of the Keystone XL pipeline that go to businesses and or individuals outside the state. For example, engineering spending related

to the Nebraska portion of the Keystone XL pipeline construction going to firms located in Tulsa, Oklahoma would reduce overall Nebraska impacts. These impacts are color-coded gray in Figure B.1.

In terms of yearly spillover, or indirect plus induced impacts, data indicate that for Nebraska, each \$1,000,000 of Keystone XL construction spending in the state generates another \$0.15 million in spending across other industries for a total impact of \$1.15 million.<sup>27</sup>

Yearly, each \$1 million of Keystone XL pipeline operations spending creates \$0.39 million in wages, salaries and self-employment income for Nebraska.

Thus, the spillover effect creates a large, additional economic impact on the economy. For example during the construction phase, the Keystone XL pipeline creates 240.1 jobs, and \$36.3 million in labor income for the state's architectural and engineering industry (see Table 3.5).<sup>28</sup>

Table B.1 on the next page provides details on the total, both construction and operations, impacts divided into direct, indirect and induced for the period 2018-34.

...Keystone XL increases overall area income and population, which produces another round of increased spending adding to sales, earnings and jobs.

<sup>27</sup>This number could potentially grow in years ahead as TransCanada purchases a portion of its pipeline, pump stations and terminals in Nebraska. In this study, it is assumed that 50 percent of these products are purchased outside the U.S. and 50 percent purchased inside the U.S. but outside of Nebraska.

<sup>28</sup>Source: IMPLAN Multiplier System, 2004.

## Appendix B: Measuring the Socioeconomic Impact of the XL Pipeline

Figure B.1: Direct, indirect and induced impacts of the Keystone XL pipeline on Nebraska and its counties

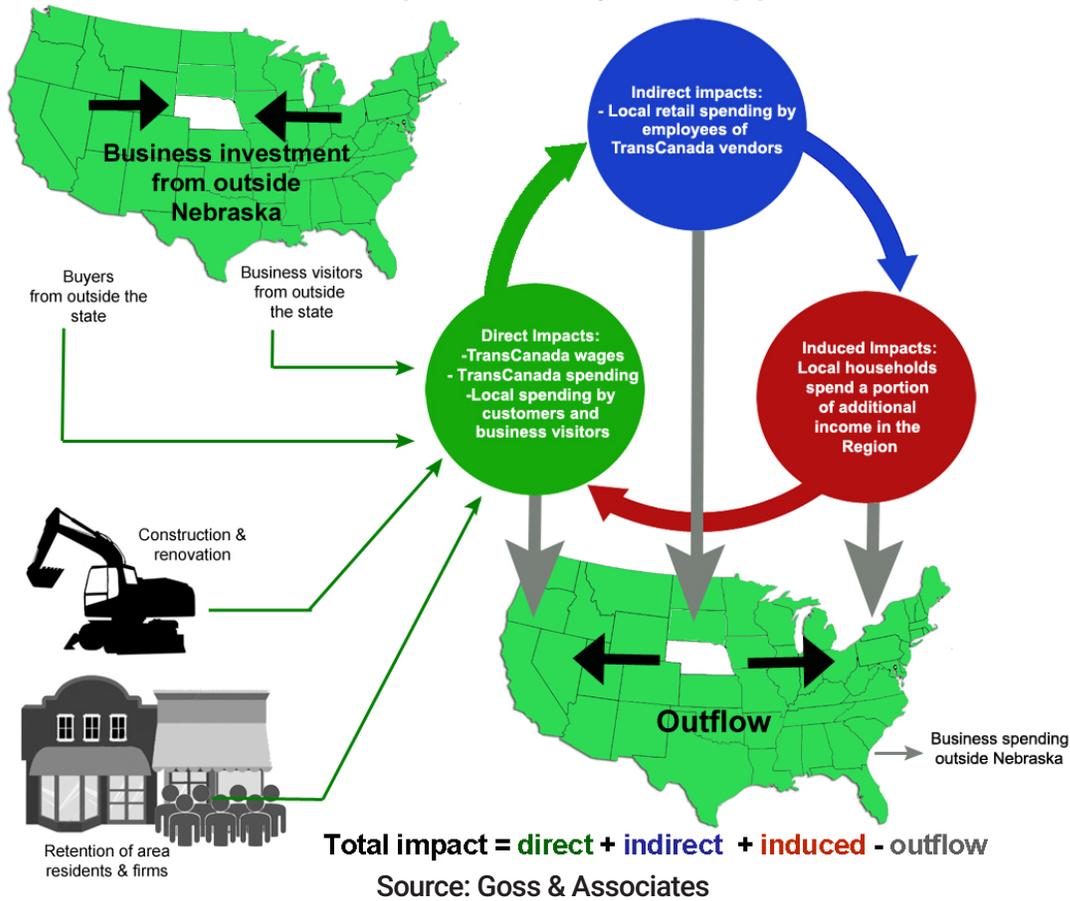


Table B.1: Direct, indirect, induced impacts (2015 dollars)			
	Total construction impacts (2018-2020)		
	Output	Labor income	Employment
Direct	\$526,543,910	\$196,650,370	1,845.6
Indirect	\$161,919,557	\$60,454,928	644.3
Induced	\$202,532,472	\$69,453,058	907.4
<b>Total</b>	<b>\$890,995,939</b>	<b>\$326,558,356</b>	<b>3,397.2</b>
	Total operations impacts (2020-2034)		
	Output	Labor income	Employment
Direct	\$823,577,525	\$271,582,000	149.1
Indirect	\$155,411,605	\$55,515,668	68.7
Induced	\$257,699,306	\$88,373,966	153.9
<b>Total</b>	<b>\$1,236,688,436</b>	<b>\$415,471,634</b>	<b>371.7</b>
<b>Source: Goss &amp; Associates based on IMPLAN output</b>			

## Appendix B: Measuring the Socioeconomic Impact of the XL Pipeline

Three factors determine the size of the spillover effects in communities and the state:

**Location.** Distance to suppliers affects the willingness to purchase locally. If local firms are unable to provide many of the supplies at competitive prices and there are alternative suppliers in Des Moines, for example, who are more price-competitive, then TransCanada/Keystone XL will be encouraged to spend outside the community. This results in greater outflows, lower multipliers and smaller impacts.

**Population size.** A larger population provides more opportunities for companies and workers to purchase locally. Larger population areas are associated with fewer outflows and larger multipliers.

Keystone XL spending outside the local economy, for example spending in Des Moines, is called a outflow and reduces the multiplier and the overall impacts.

**Clustering.** A community will gain more if the inputs required by local industries for production match local resources and are purchased locally. Thus, over time, as new firms are created to match the requirements of Keystone XL, outflows will be fewer, resulting in larger multipliers and impacts. This issue is at the heart of economic development, amplifying the impacts of the clustering of Keystone XL related facilities, investment and jobs. As the community gains more and more Keystone XL investment and jobs, educators, training institutions

and suppliers become more proficient and focused on meeting the needs of the industry.

Furthermore, suppliers unique to Keystone XL are more likely to locate in close proximity to these organizations with the passage of time. For example, it is assumed that all pipelines and pump stations come from outside of Nebraska. Over time, some of these suppliers may move to or expand in the state of Nebraska. This not only expands income and jobs in the area, it increases the size of multipliers related to Keystone XL related organizations. However, this study assumes that this does not occur during the period 2018 to 2034. Omitting these potential impacts results in a more conservative or lower estimated economic impact.

Economic models can be used in order to estimate the direct, indirect and induced impacts of Keystone XL on Nebraska. These models produce estimates that reflect the characteristics of the industry in question as well as the characteristics of the state economy in terms of location, population size, and clustering. As it will be discussed in Appendix C, an input-output model is the most appropriate methodology for measuring indirect and induced impacts. Further, the IMPLAN model is the most widely-used software package for conducting the input-output analysis. IMPLAN was used to estimate the economic impacts of Keystone XL for this study.

Thus, over time, as new firms are created to match the requirements of Keystone XL, outflows will be fewer, resulting in larger multipliers and impacts.

# Appendix C: Choosing a Technique to Measure Impacts

The three most common types of impact models are economic base, econometric and input-output (I-O). Many types of public and private-sector decisions require an evaluation of probable regional effects. Since important impacts are often economic, this requirement has created a need for regional economic impact models. Two of the three impact models have inherent disadvantages that markedly reduce their viability for estimating the impact of pipeline construction spending on the economy.

**Economic Base Model.** The economic base model divides the economy into two sectors - the local/service sector and the export sector. The chief problem with the economic base multiplier is that it is an average for all the economy, making it impossible to distinguish, for example, the impact of retail spending from that of a new manufacturing plant.

**Econometric Models.** Econometric models have two major weaknesses. The time series data used in constructing econometric models are often unavailable at the state and metropolitan area level, thus precluding county-level analysis. This is especially true for rural counties and for counties with small populations.

**Input-Output (I-O) Models.** I-O models are the most frequently-used type of analysis tool for economic impact assessment. Input-output is a simple, general equilibrium approach based on an accounting system of injections and outflows. Input-output analysis assumes that each sector purchases supplies from other sectors and then sells its output to other sectors and/or final consumers.

Historically, the high cost to develop I-O models prevented their widespread use in regional impact analysis. However, with the advent of “ready-made” multipliers produced by third parties, such as the U.S. Forest Service, I-O multipliers became a much more viable option for performing impact analysis. These “ready-made” models are made region specific at a fraction of the costs of their predecessors.

All purely non-survey techniques or “ready-made” multipliers take a national I-O table as a first approximation of regional inter-industry relationships. The national table is then made region-specific by removing those input requirements that are not produced in the region. This study will use the most widely recognized “ready-made” multiplier system, IMPLAN Multipliers.

I-O models are the most frequently-used analysis tools for economic impact assessment.

IMPLAN and RIMS (Regional Input-Output Modeling System) are two of the most widely-used multiplier models.

## Appendix C: Choosing an Technique to Measure Impacts

**IMPLAN Multipliers.** The Forest Service of the U.S. Department of Agriculture developed the IMPLAN Multipliers in the 1980s (U.S. Forest Service, 1985). For very populous areas, IMPLAN divides the economy into approximately 500 industrial sectors. Industries that do not exist in the region are automatically eliminated during user construction of the model (e.g. coal mining in Omaha).

IMPLAN uses an industry-based methodology to derive its input-output coefficients and multipliers. Primary sources for data are County Business Patterns data and U.S. Bureau of Economic Analysis data.



Researchers have used IMPLAN to estimate the impact of changes in military spending on the Washington state economy (Hughes, et. al, 1991).<sup>29</sup>

<sup>29</sup>Hughes, D., Holland, D. and P. Wandschneider, "The Impact of Changes in Military Expenditures on the Washington State Economy," *The Review of Regional Studies*, Vol. 21(3), 1991, pp. 221-234.

IMPLAN and RIMS (Regional Input-Output Modeling System) are two of the most widely-used multiplier models. IMPLAN has been compared to other multiplier systems and found to produce reliable estimates (Richman and Schwer, 1993).<sup>30</sup> Likewise, Crihfield and Campbell (1991), in estimating the impacts of opening an automobile assembly plant, concluded that IMPLAN's outcomes are, on balance, somewhat more accurate than RIMS.<sup>31</sup>

IMPLAN Multipliers possess the following advantages over other I-O multiplier systems:

1. Price changes are accounted for in the creation of the multipliers.
2. Employment increases or decreases are assumed to produce immediate in or out-migration.

<sup>30</sup>Richman, D.S. and R.K. Schwer. "A Systematic Comparison of the REMI and IMPLAN Models: The Case of Southern Nevada." *Review of Regional Studies*, Vol. 23(2), 1993, pp. 143-161.

<sup>31</sup>Crihfield, J. B. and H. S. Campbell, Jr. 1991. "Evaluating alternative regional planning models," *Growth and Change* 22(2):1-16.

# Appendix D: Details on Direct Spending

Tables D.1 through D.5 detail direct TransCanada spending for construction and operation of the Nebraska portion of the Keystone XL pipeline between 2018 and 2034.

**Table D.1: Estimated Keystone XL services spending in Nebraska, 2018-20 (2015dollars)**

IMPLAN Industry #	Industry	July 1, 2018 - June 30, 2019	July 1, 2019 - June 30, 2020
417	Commissioning	\$9,266,116	\$9,266,116
38	Construction camp	\$51,759,635	\$51,759,635
369	Construction management	\$59,659,408	\$59,659,408
369	Engineering	\$30,559,480	\$30,559,480
386	Inspections	\$19,582,505	\$19,582,505
375	Community, safety and environment	\$9,484,416	\$9,484,416
375	Misc environmental	\$3,117,075	\$3,117,075
31	Power infrastructure	\$19,692,230	\$19,692,230
340	Stockpiling	\$5,291,883	\$5,291,883
351	Telecom, SCADA, cathodic protection	\$3,010,173	\$3,010,173
	<b>Total</b>	<b>\$211,422,920</b>	<b>\$211,422,920</b>

**Note: Total Keystone XL services spending to support construction of the Nebraska portion of the pipeline is estimated to be \$408 million (source: TransCanada, 2015)**

## Appendix D: Details on Direct Spending

**Table D.2: Distribution of land purchases, easements and crop destruction, 2018 (current dollars)**

IMPLAN Industry #		Allocation of Land Spending
31	Utilities	\$7,561,461
320	Transportation	\$12,689,371
324	Food at home	\$5,942,221
325	Personal Care Products and Services	\$896,869
327	Clothing	\$2,356,625
329	Tobacco products	\$666,084
330	Reading	\$153,856
330	Miscellaneous	\$1,373,446
356	Personal insurance and pensions	\$7,833,524
361	Shelter	\$12,950,175
393	Education	\$1,202,704
394	Healthcare	\$5,268,632
410	Entertainment	\$3,701,926
413	Food away from home	\$3,745,081
413	Alcoholic beverages	\$576,022
418	Housekeeping	\$3,354,812
425	Cash Contributions	\$2,771,285
	<b>Total</b>	<b>\$73,044,094</b>

Source: Goss & Associates allocation based on U.S. Bureau of Labor Statistics Consumer Expenditure Study

**Table D.3: Direct construction wages & salaries paid, 2018 and 2019 (current or 2017 dollars)**

	Gross TransCanada Wages & Salaries	Percent Nebraska resident workers	Total labor costs for Nebraska workers
Montana	\$882,809,847	6.1%	\$53,851,401
Nebraska	\$826,814,389	10.0%	\$82,681,439
South Dakota (excludes taxes)	\$985,879,798	6.1%	\$60,138,668
<b>Total (Implan industry # 29)</b>	<b>\$2,695,504,034</b>	<b>7.3%</b>	<b>\$196,671,507</b>

Source: Goss & Associates based on data provided by TransCanada

## Appendix D: Details on Direct Spending

**Table D.4: Estimated direct spending from balance of costs, 2018-19 (current dollars)**

	July 1, 2018 to June 30, 2019	July 1, 2019 to June 30, 2020	Total
Property taxes during construction	\$6,012,387	\$6,012,387	\$12,024,775
Insurance	\$7,662,621	\$7,662,621	\$15,325,243
Regulatory & legal	\$1,332,213	\$1,332,213	\$2,664,426
<b>Total</b>	<b>\$15,007,222</b>	<b>\$15,007,222</b>	<b>\$30,014,443</b>

Source: TransCanada

**Table D.5: Pipeline operations spending for first 15 years of operations**

IMPLAN Industry #	Year	Nebraska Yearly Spending
431, 337, 432	2020	\$47,545,050
431, 337, 432	2021	\$69,468,395
431, 337, 432	2022	\$69,425,637
431, 337, 432	2023	\$69,443,145
431, 337, 432	2024	\$69,523,108
431, 337, 432	2025	\$69,667,794
431, 337, 432	2026	\$69,879,557
431, 337, 432	2027	\$70,160,833
431, 337, 432	2028	\$70,514,148
431, 337, 432	2029	\$70,942,119
431, 337, 432	2030	\$71,447,459
431, 337, 432	2031	\$72,032,979
431, 337, 432	2032	\$72,701,593
431, 337, 432	2033	\$73,456,319
431, 337, 432	2034	\$74,300,286
431, 337, 432	2035	\$37,618,369
	<b>Total</b>	<b>\$1,078,126,791</b>

Source: Goss & Associates based on estimated \$129,220 per mile (in 2014) with 275.17 miles in Nebraska with a 3.63% growth rate

# Appendix E: Construction Camp<sup>32</sup>

Non-local construction workers temporarily residing in Nebraska will require short-term accommodations. It is assumed that the Keystone XL workers would not relocate with their families and their stay in any one community would be using temporary housing, such as hotels/motels, RV sites, and campgrounds.

## Assumptions:

- Each TransCanada construction camp would be capable of housing up to 900-1,300 workers. Camps would typically include sleeping areas with shared and private baths, craft rooms, recreation facilities, media rooms, kitchen/dining facilities, laundry facilities, a security/infirmity unit, offices, and wastewater treatment facilities. These temporary construction camps would be permitted, constructed, and operated consistent with applicable county, state, and federal regulations, and would likely reduce but not eliminate impacts on nearby towns and public services.
- Construction of the proposed project, including the pipeline and pump stations, would result in hiring approximately 5,000 to 6,000 workers over the three-year construction period. As indicated above, it is expected that roughly 10 percent of the construction work force would be hired from local labor markets, thus 500 to 900 local workers would be hired throughout the entire region of influence, or 50 to 90 local workers per construction spread.
- It is assumed that one-third of workers installing Keystone XL in Nebraska will reside in construction camps.

---

<sup>32</sup>U.S. Department of State , Keystone XL Pipeline Project, Final Supplemental Environmental Impact Statement (SEIS), <http://keystonepipeline-xl.state.gov/finalseis/>

**Ernie Goss** is the Jack MacAllister Chair in Regional Economics at Creighton University and is the initial director for Creighton's Institute for Economic Inquiry. He is also principal of the Goss Institute in Denver, Colorado. Goss received his Ph.D. in Economics from The University of Tennessee in 1983 and is a former faculty research fellow at NASA's Marshall Space Flight Center. He was a visiting scholar with the Congressional Budget Office for 2003-04, and has testified before the U.S. Congress, the Kansas Legislature, and the Nebraska Legislature. In the fall of 2005, the Nebraska Attorney General appointed Goss to head a task force examining gasoline pricing in the state.

He has published more than 100 research studies focusing primarily on economic forecasting, and on the statistical analysis of business and economic data. His book Changing Attitudes Toward Economic Reform During the Yeltsin Era was published by Praeger Press in 2003, and his book Governing Fortune: Casino Gambling in America was published by the University of Michigan Press in March 2007.

He is editor of Economic Trends, an economics newsletter published monthly with more than 11,000 subscribers, produces a monthly business conditions index for the nine-state Mid-American region and conducts a survey of bank CEOs in ten U.S. states. Survey and index results are cited each month in approximately 100 newspapers and citations have included the New York Times, Wall Street Journal, Investors Business Daily, The Christian Science Monitor, Chicago Sun Times and other national and regional newspapers and magazines. Each month 75-100 radio stations carry his Regional Economic Report.

Ernie Goss, Ph.D.  
MacAllister Chair Creighton University  
Creighton University  
Omaha, NE 68178  
[www.outlook-economic.com](http://www.outlook-economic.com)  
[egoss@gossandassociates.com](mailto:egoss@gossandassociates.com)

**Jeffrey Milewski** is senior research economist at Goss & Associates. He received his master's degree in political economy from the London School of Economics and Political Science in 2013. He completed his bachelor's degree at Creighton University in 2007, having studied economics and finance. Milewski also has experience working in finance, and as an entrepreneur. Recently, he has co-authored impact studies on a range of topics such as property-casualty insurance, highway expansion, cost/benefit, and national sporting events.

# Appendix G - Goss & Associates

## Research Consultancies, 2014-Current

---

1. Winter 2017. Contract with Boys Town. A Century of Contributions to the Economy of the Omaha Metropolitan Region and to the Well-Being of its Children and Families (currently being finalized).
2. Winter 2017. Contract with Turner Park, LLC. The Impact of a Walkable, Workable, and Livable Midtown Omaha.
3. Summer 2016. Contract with Equal Justice USA to estimate the economic impact of the death penalty on the state of Nebraska.
4. Fall 2015. Contract with 4 Lanes 4 Nebraska to estimate the impact of the expansion of Highway 81 on Nebraska.
5. Summer 2015. Contract with Consumer Energy Alliance to update previous study examining the impact of the Keystone Pipeline, Washington, DC.
6. Summer 2015. Contract with the Nebraska Bankers Association to examine how credit union tax exemptions and Farm Credit GSE2 status affect the commercial banking industry and competitiveness within the industry, and the effects on consumer choices.
7. Spring 2015. Contract with Ho-Chunk to estimate the benefits of operations of Ho-Chunk on the Winnebago Community, and on the states of Iowa, Nebraska and South Dakota.
8. Spring 2015. Contract with College World Series, Inc. to estimate the economic impact of the College World Series on the city of Omaha and the state of Nebraska, 2014-15
9. Spring 2015. Contract with HDR to estimate the impact of merging UNL's College of Architecture and the Hixson-Lied College of Fine and Performing Arts
10. Spring 2015. Contract with the Platte Institute to estimate the costs and benefits of public power in Nebraska.
11. Spring 2015. Contract with 4 Lanes 4 Nebraska to estimate the impact of the expansion of Highway 275 on Nebraska.
12. Summer 2014. Contract with Consumer Energy Alliance to update previous study examining the impact of the Keystone Pipeline, Washington, DC.
13. Spring 2014. Contract with Fort Dodge Growth Alliance to examine the impact of various economic development options for the eight county economic area, Fort Dodge, Iowa.
14. Spring 2014. Contract with Alegend Health to examine the impact of Alegend's clinical and hospital operations on Iowa and Nebraska (with University of Nebraska-Lincoln).
15. Winter 2014. Contract with 4R Gun Club to determine the economic feasibility of a full-service shooting range in Omaha, Nebraska.
16. Winter 2014. Contract with Creighton University School of Dentistry to determine the economic contribution of an expanded dental school on the State of Nebraska and City of Omaha.