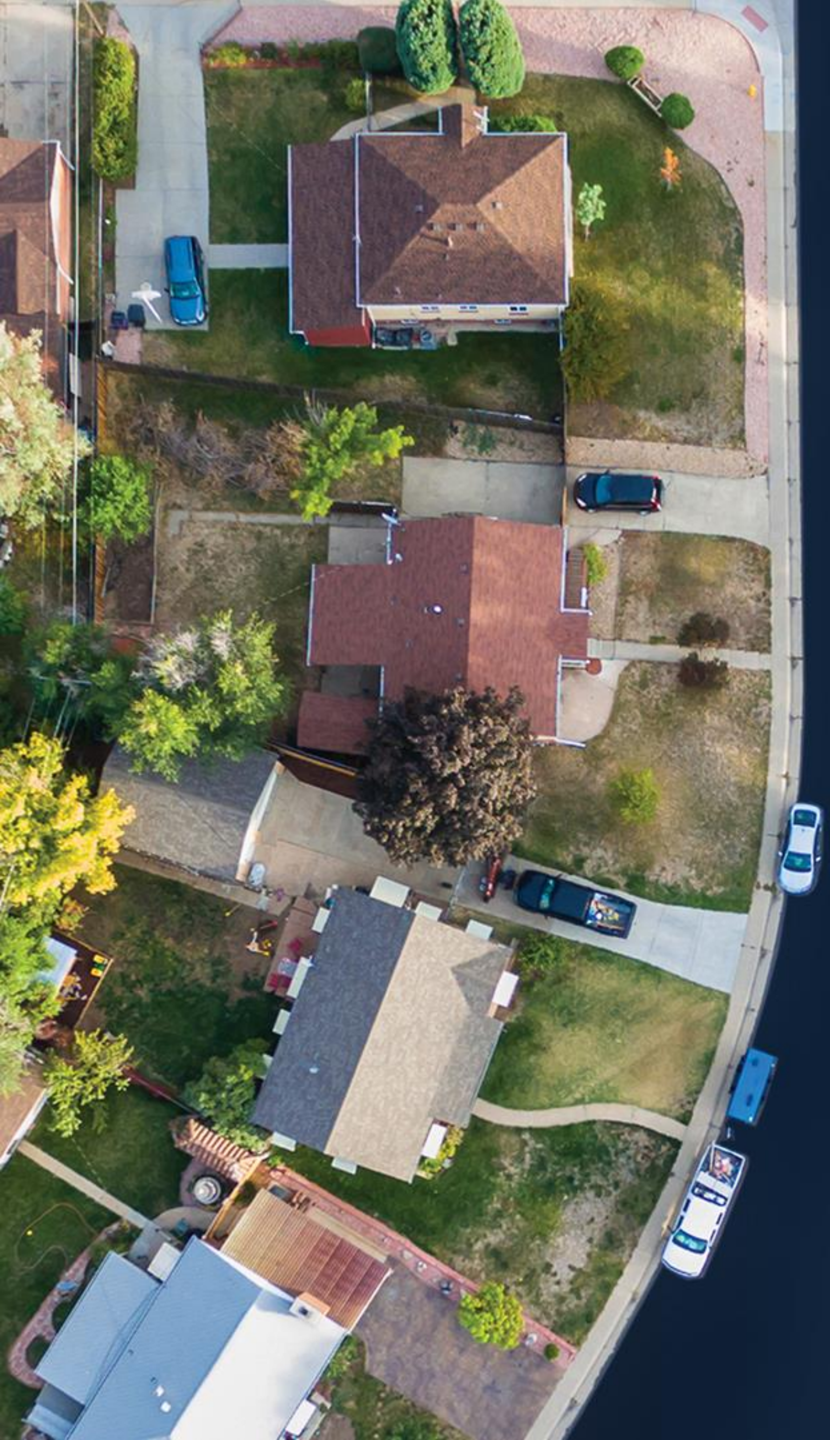


COMMON SENSE Policy Roundtable

Getting REMI Results to Stick

Take-aways from a year of economic modeling

REMI Users Conference 2018

About Us/Mission

- **Non-profit free enterprise think tank.**
- **Dedicated to the protection and promotion of Colorado's economy.**
- **Mission to research and promote common sense solutions for economic issues facing Colorado.**

New study shows that without substantial improvement in student performance, Amendment 66 is drag on the Colorado economy.

Leeds School of Business Report Uses State-of-the-Art Dynamic Model to Determine What Impact Amendment 66 Will Have on Our State's Economy

DENVER, Colo., October 9, 2013—Two comprehensive studies using a newly calibrated, dynamic economic modeling system developed by the Regional Economic Models Inc., or REMI that analyzes the ripple effects of public policy choices across the economy shows that the passage of Amendment 66 would be a drag on Colorado's economy.

Restrictions on the Supply of Affordable Entry-Level Housing in Colorado

Key Findings:

Denver for-sale home prices have increased much more quickly than rent prices, particularly at the entry level. For the previous 5 years through December 2016, the median Denver home price increased 73.2%, while median rent prices increased just 46.4%.

Condominium prices in particular have skyrocketed. According to Metro Denver EDC average sales price for single-family homes in Denver rose 5.1% year-over-year to $421,962, while the average price of condos increased 21.3%.

Median home prices in Denver have reached all-time highs partly as a result of the insufficient supply of new housing for entry-level homes, especially in the area of condominiums. During 2016, nearly 90% of all existing condos re-sold in Denver were priced below $400,000, pointing to strong demand in the entry-level segment. However, less than 30% of the new condo supply built in 2016 was priced below $400,000, and nearly 40% was priced over $1 million.

Several studies from recent years have found that Colorado construction defects laws are having adverse effects on the housing market and the supply of affordable condominiums. A 2013 study released by the Denver Region Council of Governments found that the increased risk of litigation and resulting insurance costs due to Colorado's construction defect laws have increased condominium builder expenses by as much as $15,000 per unit, potentially making any condos priced under $450,000 uneconomic to build.

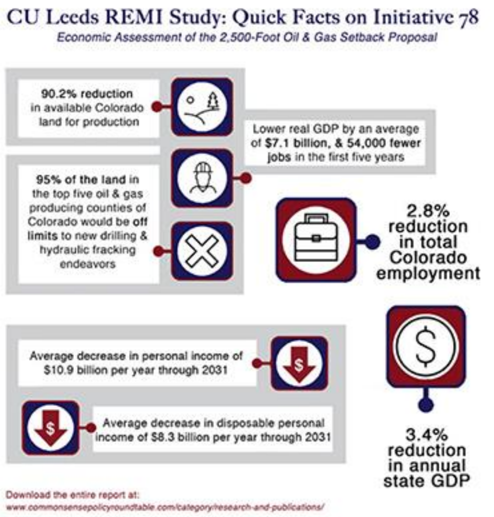
The REMI simulations found that even a 1% decrease in residential investment due to reduced building would result in over 1,800 fewer jobs for Coloradans in 2017, and over the next five years would decrease state GDP by $1.1 billion and revenue to the state General Fund by nearly $32 million. A 5% decrease in residential investment would eliminate 8,850 Colorado jobs the first year, and over the next five years would reduce state GDP by $5.2 billion and state revenue by $156 million.

The simulation also found that a 1% increase in housing costs would reduce Coloradans' aggregate real disposable income by $322 million in just the first year. A 5% increase would reduce Coloradan's real disposable income by $1.8 billion in the first year.

The crowding-out of young buyers impacts households by preventing them from building home equity, but also affects the state at large by leading to reduced migration, greater income inequality, increased infrastructure pressures as a result of urban sprawl, and disincentives for businesses to move to or open offices in the state.

COMMON SENSE — DENVER SOUTH — REALTORS

Full report to be released March 1, 2017



Impact in Colorado – In the News

Education

A closer look at the survey that quantifies 'What if Colorado schools were No. 1 in the U.S.?'

Common Sense Policy Roundtable Researches Issues Affecting Colorado Jobs and Economy

September 3, 2017 by Anne Trujillo

DP Ikard, Kopp: PERA reform must provide budget...

OPINION › OPINION COLUMNISTS

PERA reform must provide budget relief to schools, local governments and taxpayers

OPINION › EDITORIALS

PERA bill has a major flaw

DENVER BUSINESS JOURNAL

By THE DENVER POST EDITORIAL BOARD | March 10, 2018 at 12:10 pm

The Gazette
gazette.com

GUEST COLUMN: Solving the affordable housing crisis

The Gazette
March 25, 2017
by Earl Wright

REMI Partnership

What is dynamic modeling? Why is it important?

Answer “What If” questions

Factor in dynamic changes from price, wages, costs, supply and multiplier effect

REMI Partnership

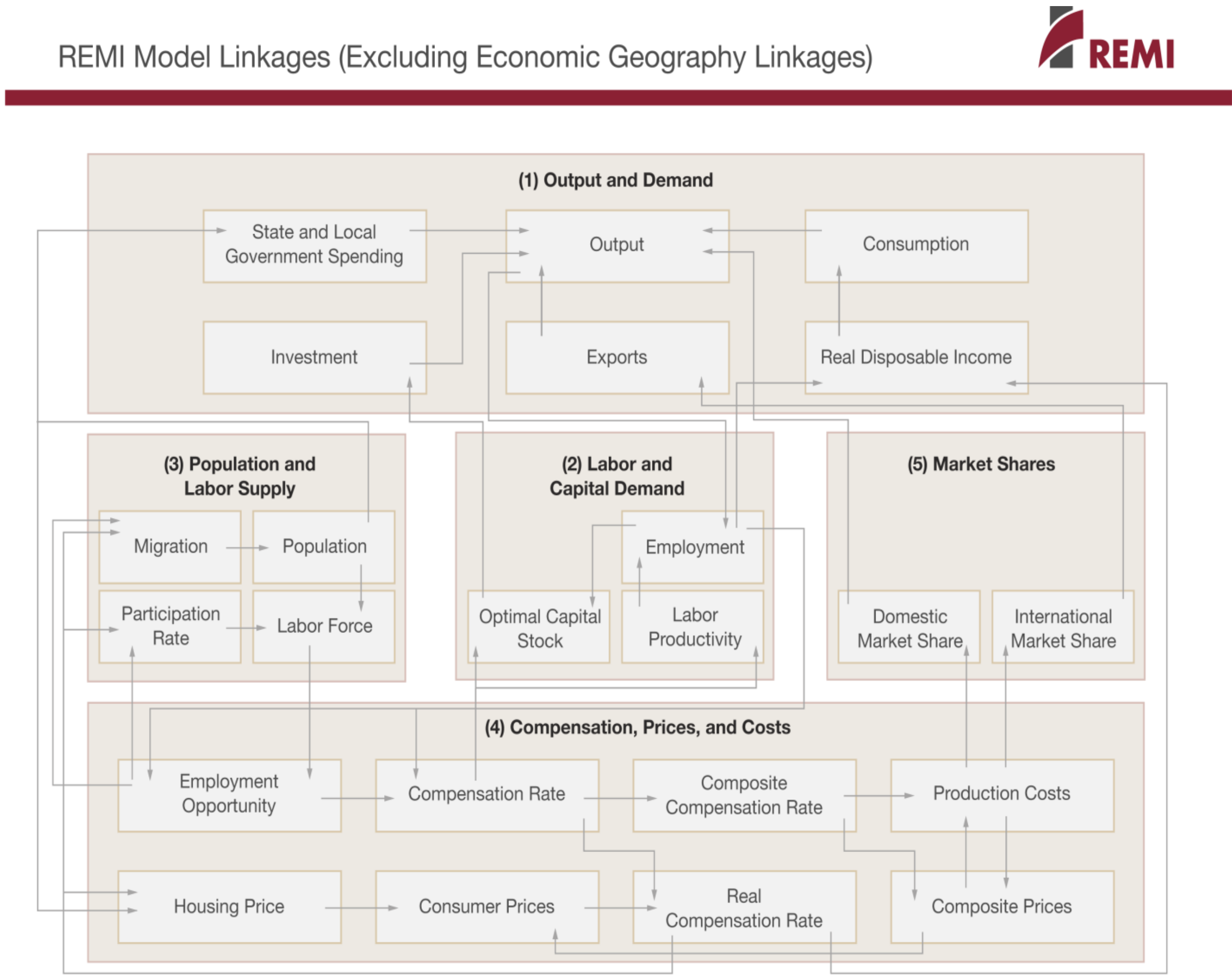
A year in review

- 1% Housing Growth – Statewide and Lakewood
- PERA
- What if Colorado Schools Were Number 1?
- Amendment 73 – A tax increase for schools
- Proposition 112 – A 2,500-ft setback
- Comparison of Proposition 109 and 110 – Alternative transportation funding solutions

REMI Model

Tax-PI and PI+

- Dynamic Simulation Model
  - Computable General Equilibrium
  - Input/output
  - New Economic Geography
  - Econometrics



What if Colorado Schools Were #1?

What if Colorado had the best graduation rate in the nation?

What if Colorado graduates met the education demands of the #1 economy?

Colorado Today

#1 Economy in nation

3% Unemployment rate

….

#45 rank in graduation rate

28 out of 100 kids graduating obtain some post-secondary education within 4 years of graduating

US News World Report, BLS, NCES, CDHE

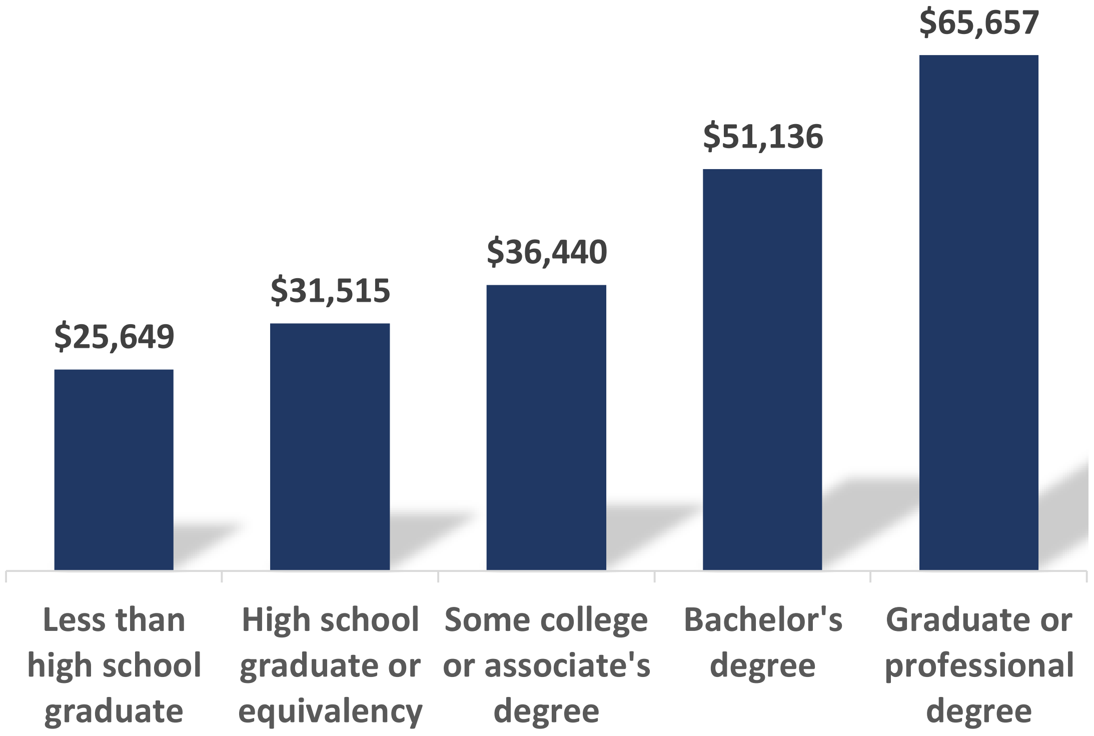
The Big Disconnect:
Colorado Needs a Highly Skilled Workforce

2nd highest level of demand for workers with some post-secondary attainment anywhere in the nation

Georgetown Center on Education and the Workforce

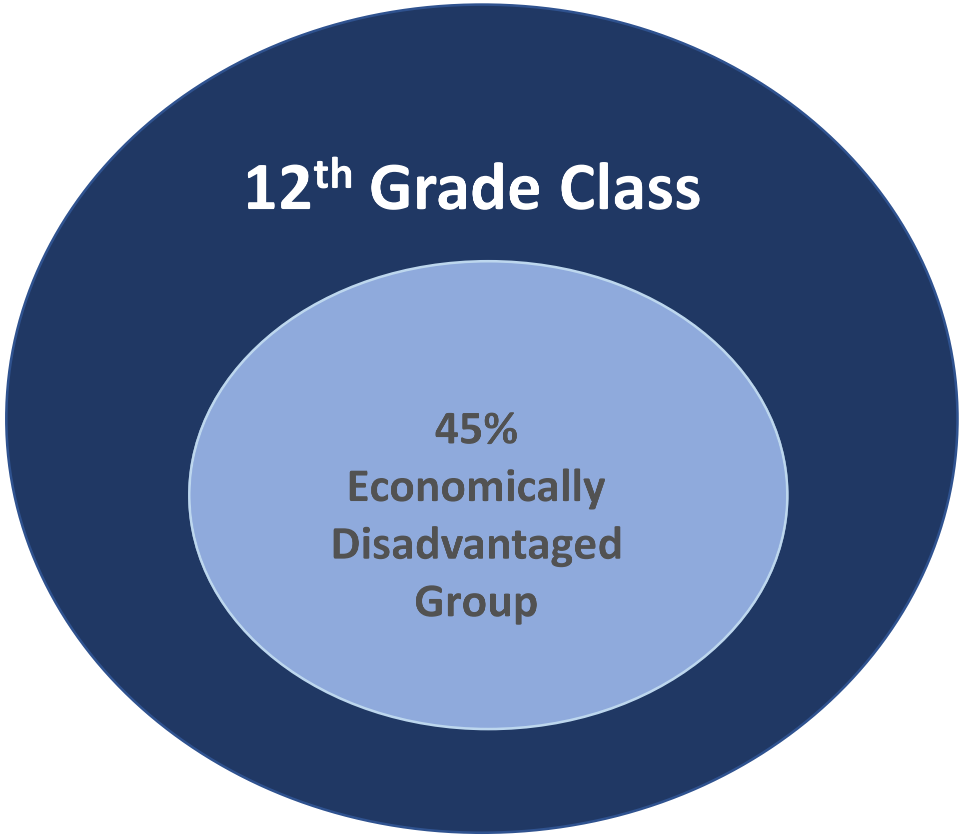
Impact of Just One Student

Education Level	Additional Income %
High school graduate/equivalent	30%
Some college/Associate's degree	48%
Bachelor's degree	107%
Masters or higher	168%



Census, 2016

Students at Most Risk



Economically Disadvantaged Graduation Rate Increase

75% → 93.3%

Total Class Graduation Rates

84.1% → 92.3%

CDE, Graduation Statistics

Impact of an Entire Class

Class of 2019

Increase in Direct Earnings ($ Millions)	$150
Total Jobs Impact (Units)	1,480
Total GDP Impact ($ Millions)	$195
Consumer Spending ($Millions)	$206
Total Dynamic Fiscal Impact to State ($Millions)	$8.62
Savings on Public Assistance, Supplemental Security Income and SNAP ($Millions)	$3.85
Savings on Lower Incarcerations ($Millions)	$0.48

Tax-PI Simulation Results

Over The Span of 10 Years

These graduates would **earn an additional $8.5 billion**

$1 billion in new revenue and public savings

$1.4 billion increase in home spending

14,600 new jobs created

Over $12 billion in increased GDP growth

Comparing Economic Impacts

Figures cited from latest economic impact study of each category

What does it mean to be #1

OVER 10 YEARS IF COLORADO IMPROVED EDUCATION
TO THE LEVELS NEEDED BY THE WORKFORCE,
57,600 MORE HIGH SCHOOL GRADUATES
WOULD OBTAIN SOME FORM OF POST-SECONDARY EDUCATION.
THAT'S ENOUGH TO FILL THE PEPSI CENTER THREE TIMES OVER

REMI Partnership Study
Economic and Fiscal Impacts of Prop 112

Research Conducted By CSPR Staff

Review Conducted by faculty and staff at Colorado School of Mines

- **Dr. Ian Lange, Director of Mineral and Energy Economics Masters program**
- **Dr. Braeton Smith**

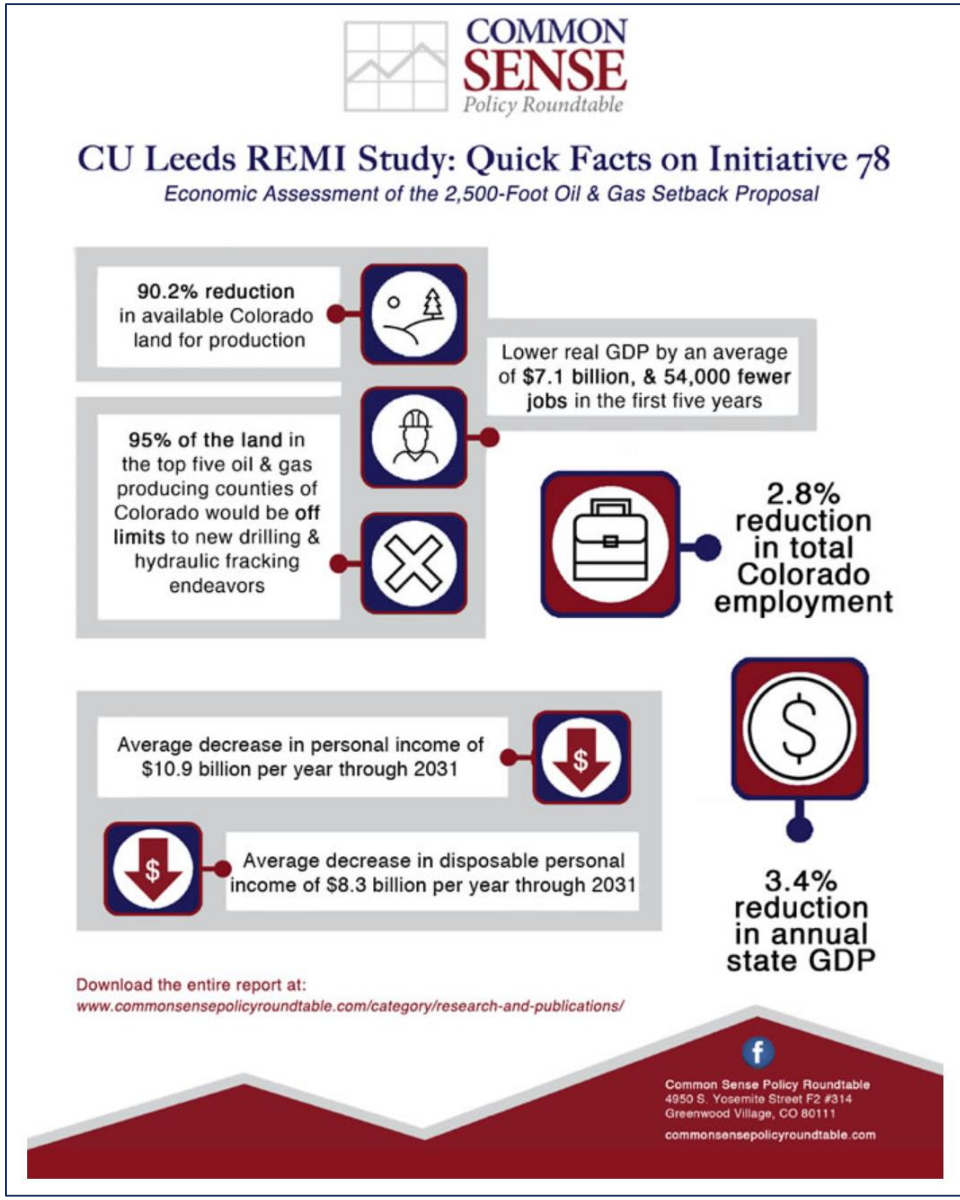
COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT

Previous CSPR Research

Business Research Division - University of Colorado Leeds School of Business

- **2014 – Economic Impact of Oil and Gas Sector**
  - **Industry supported 111,000 jobs statewide**
  - **Contributed $29.6B to GDP in 2012**

- **2016 – Economic Impact of 2,500-ft setback**
  - **Yr 6-10 = 115,800 annual job reduction**
  - **Yr 11-15 = -4.5% GDP**



2018 Blue Book Language

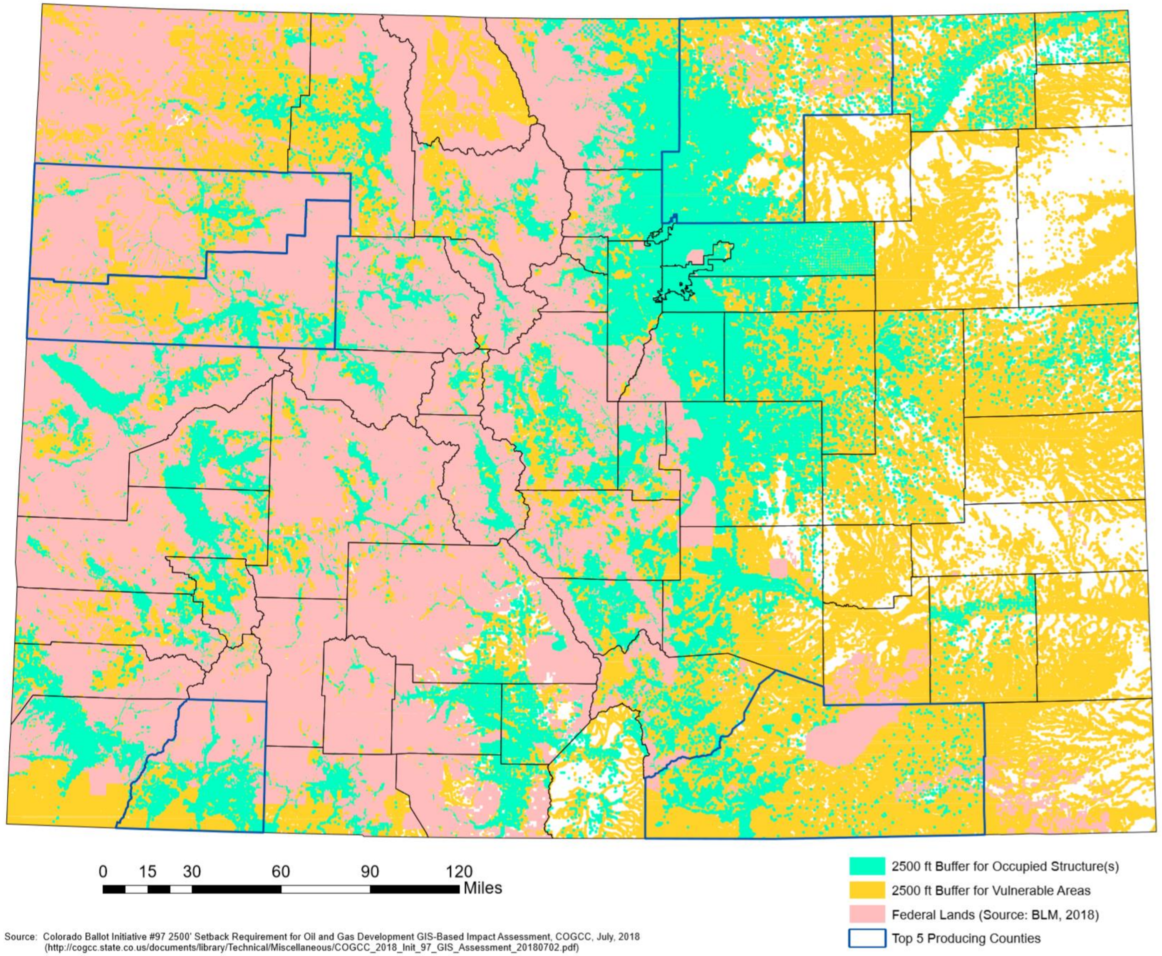
Estimate of Fiscal Impact

State government revenue and spending. Proposition 112 is expected to decrease the amount of severance tax, royalty payments, and lease revenue that state government collects in the future. Because the measure does not impact existing oil and natural gas development, no immediate impact on state revenue is anticipated; however, because the measure reduces the surface land available for the development of new oil and natural gas operations, future state revenue from these sources will be reduced. Proposition 112 will also reduce future income taxes to the state. Since the economic conditions and geographic limitations affecting oil and natural gas production are uncertain, the specific reductions in state revenue cannot be estimated.

Department of Natural Resources. Severance tax revenue received by the state funds both operating expenses of the department and specific programs, including water supply project grants, low-income energy assistance, control of invasive species, and a variety of other programs. Funding for these programs will be reduced.

Local government revenue and spending. Proposition 112 is also anticipated to reduce future property tax revenue collected by local governments. Limitations on new drilling will reduce local property tax collections, since producing well sites have higher assessed value than inactive nonproducing areas. The change in local revenue and expenditures also cannot be estimated. Local governments receive a share of the state's severance taxes to offset the impacts of oil and natural gas development. This revenue will be reduced.

July 2nd 2018 – COGCC 2,500ft setback map



Source: Colorado Ballot Initiative #97 2500' Setback Requirement for Oil and Gas Development GIS-Based Impact Assessment, COGCC, July, 2018 (http://cogcc.state.co.us/documents/library/Technical/Miscellaneous/COGCC_2018_Init_97_GIS_Assessment_20180702.pdf)

% Reduction in Non-Federal Surface land in Weld County

- **Occupied structures = 45.7%**
- **Vulnerable areas = 78.7%**

FIGURE 1: 2018 SURFACE SETBACK AREA AT CURRENT 500 FEET

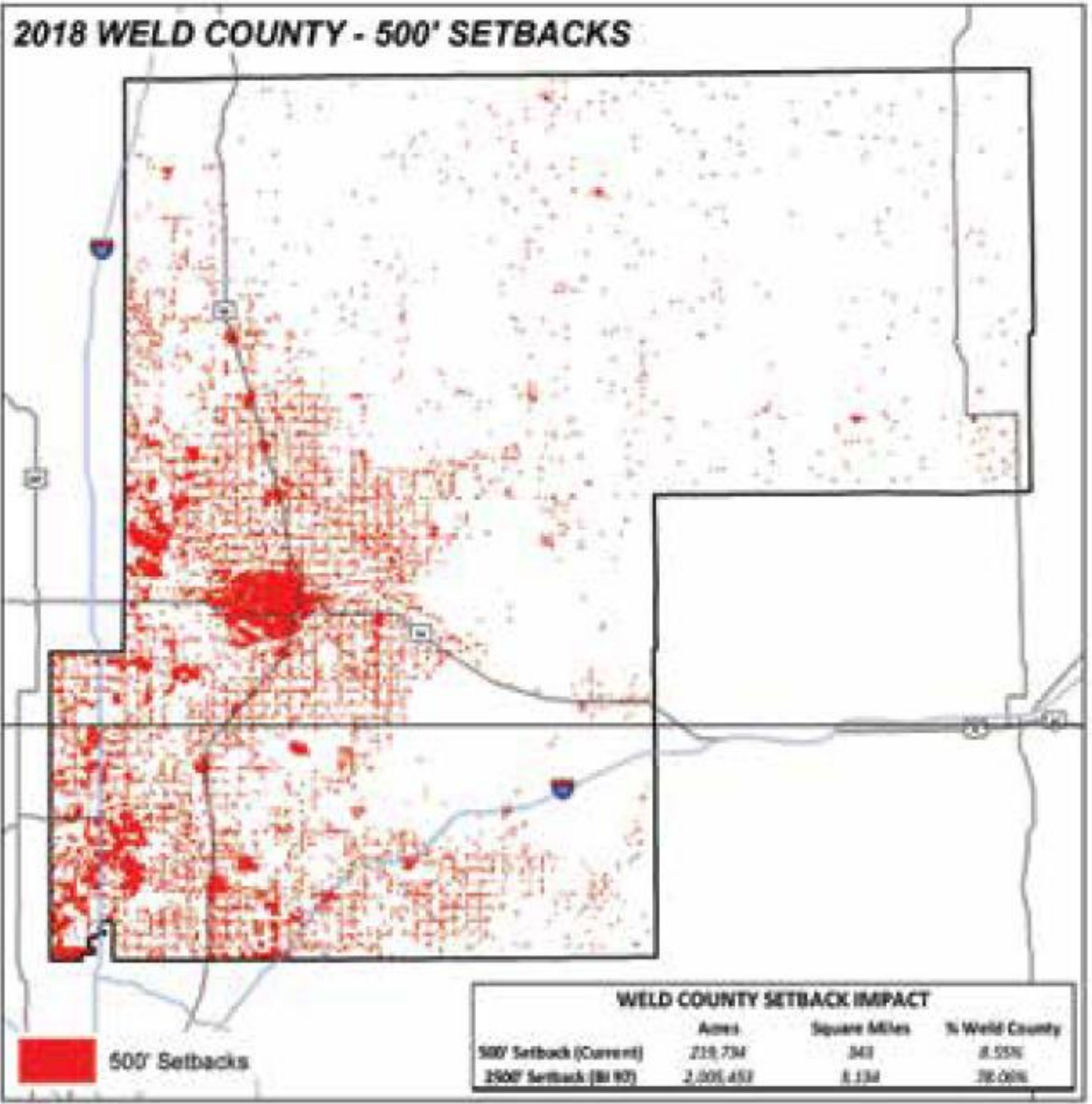
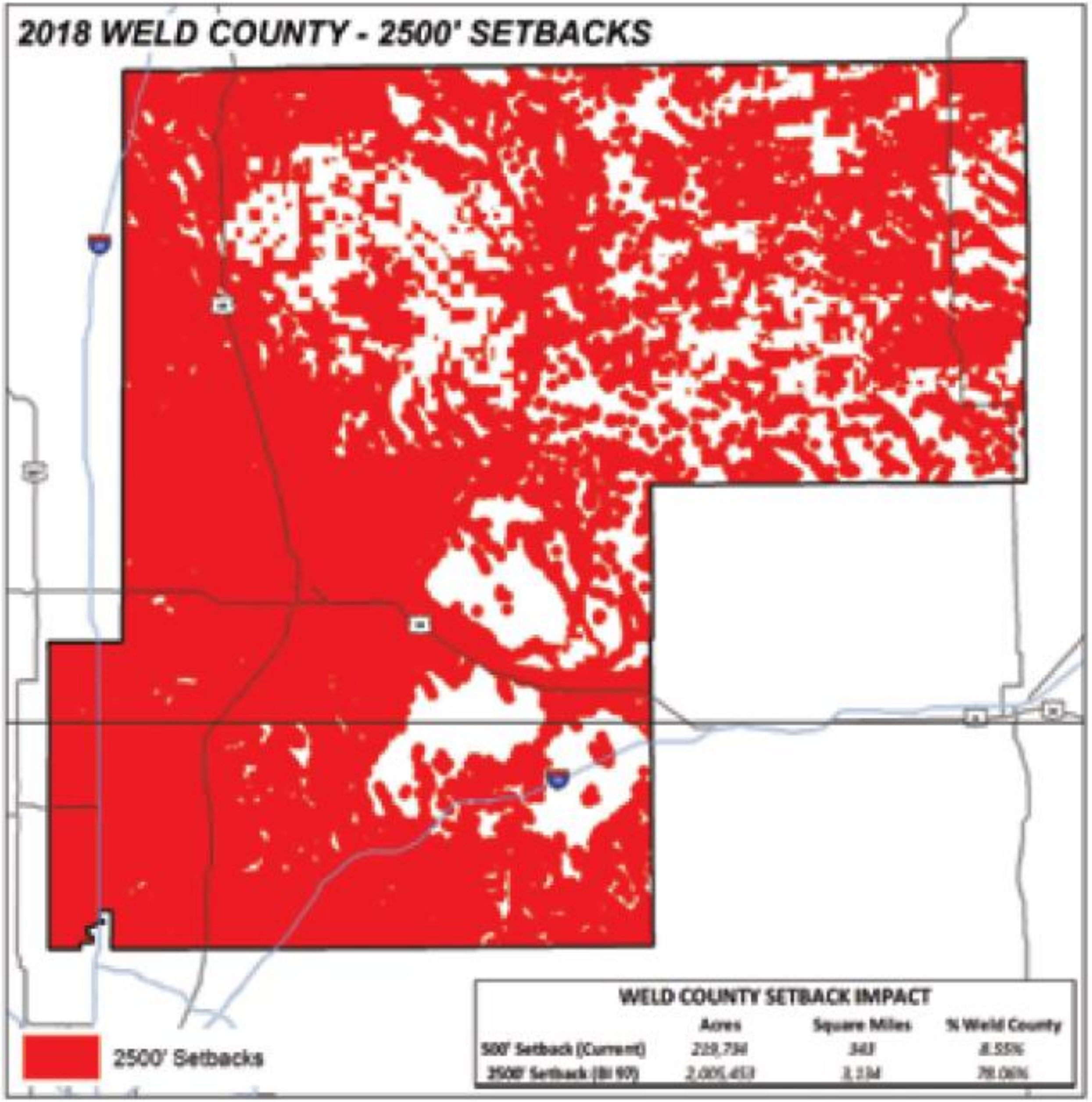


FIGURE 2: 2018 SURFACE SETBACK AREA AT PROPOSED 2,500-FEET



5-year average percent of new production inside proposed setback area

89.42% of new oil production + **87.30%** of new gas production

*COGCC Data

Scenario 1

10% of the new oil and gas activity expected to occur within the setback area will still be able to occur on land outside the setback area.

Scenario 2

30% of the new oil and gas activity expected

to occur within the setback area will now occur on land outside the setback area.

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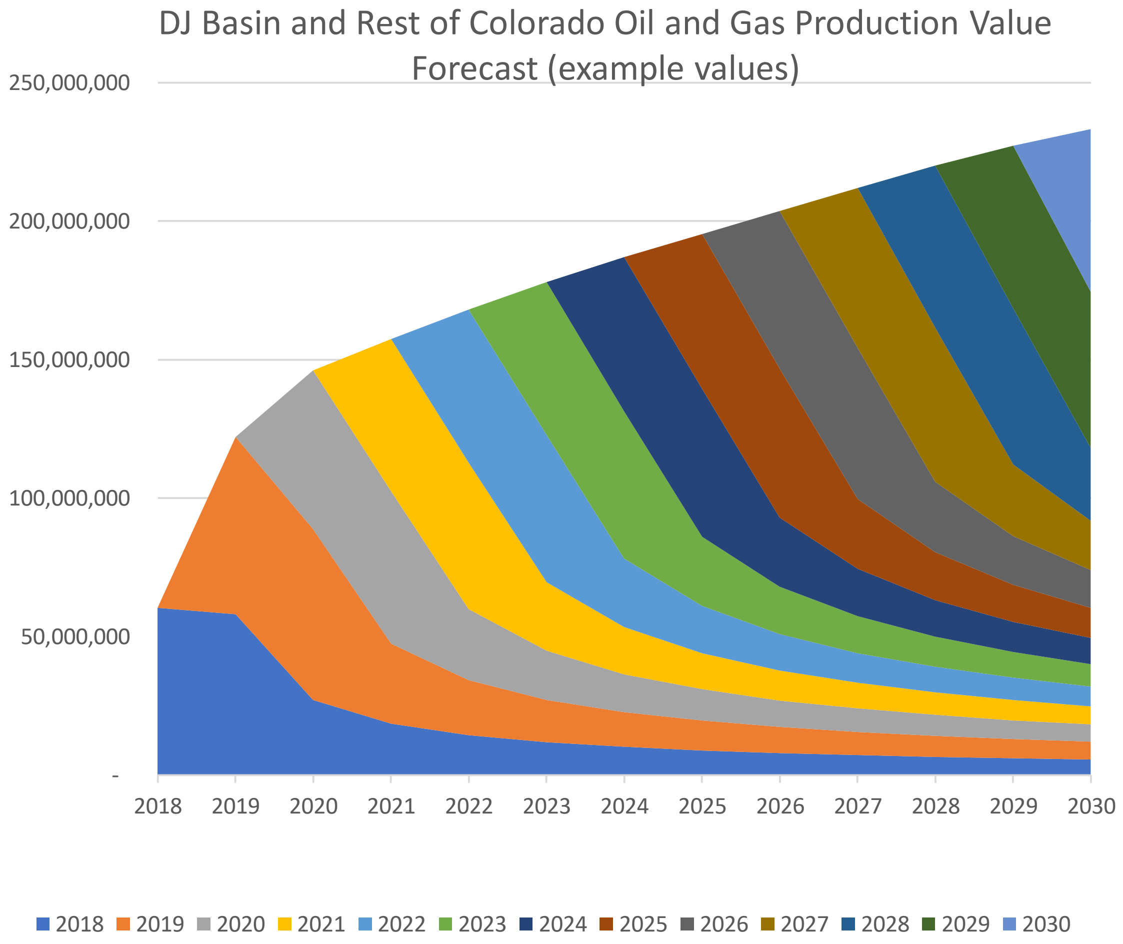
Forecast Methodology

1. **Correlation of rigs to price**
2. **Project annual new rigs**
   1. **CME and Moody's**
3. **Multiply by average production per rig**
   1. **COGCC data**
4. **Estimate annual production of new wells**
   1. **Projected decline rates**



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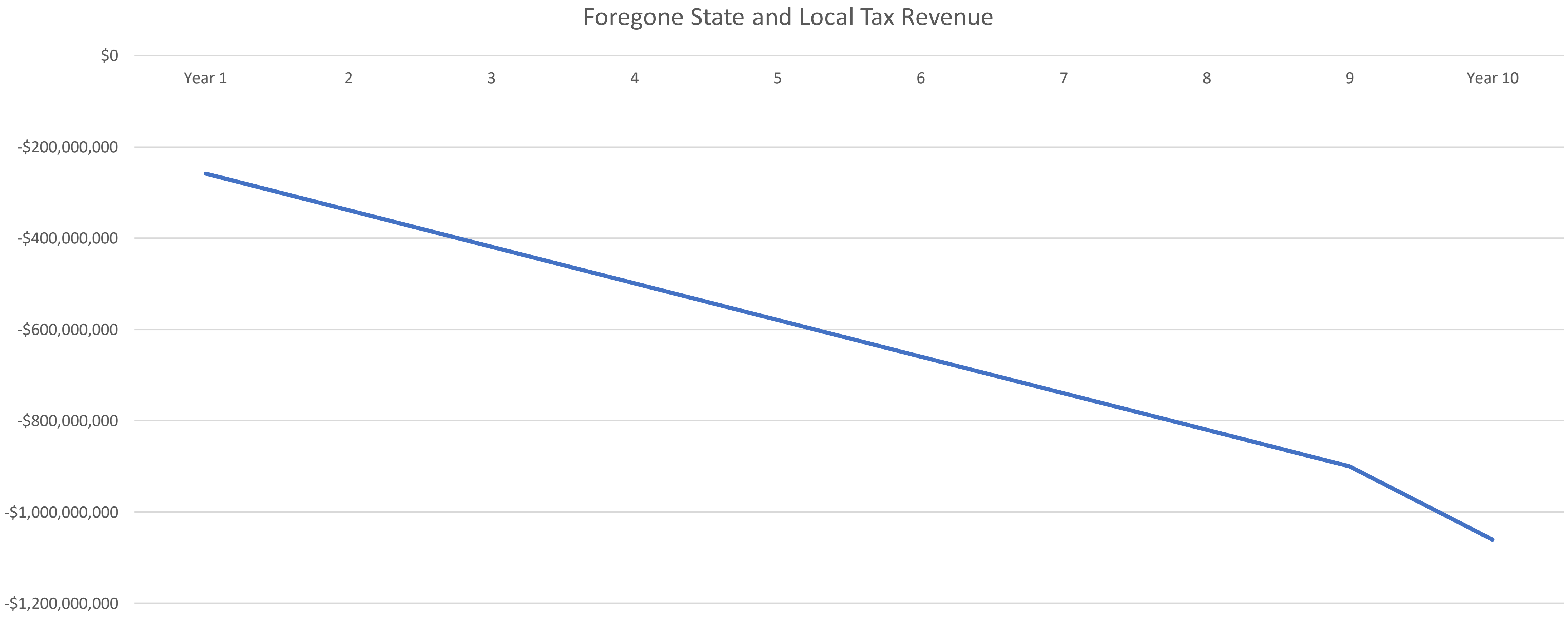
Direct Impact on Production

YEAR	10% DISPLACEMENT			30% DISPLACEMENT		
	Dollar Value Loss in the Setback Area	% of New Production Loss	% of All Production Loss	Dollar Value Loss in the Setback Area	% of New Production Loss	% of All Production Loss
STATE TOTAL						
2019	-$4.04	-80.1%	-22.0%	-$3.14	-62.3%	-17.1%
2020	-$7.24	-80.0%	-40.1%	-$5.63	-62.2%	-31.2%
2021	-$8.70	-80.0%	-47.4%	-$6.77	-62.2%	-36.9%
2022	-$9.81	-80.0%	-52.2%	-$7.63	-62.2%	-40.6%
2023	-$10.83	-79.9%	-55.6%	-$8.42	-62.2%	-43.3%
2024	-$11.76	-79.9%	-58.3%	-$9.15	-62.2%	-45.3%
2025	-$12.69	-79.9%	-60.6%	-$9.87	-62.2%	-47.1%
2026	-$13.58	-79.9%	-62.5%	-$10.56	-62.1%	-48.6%
2027	-$14.50	-79.9%	-64.2%	-$11.28	-62.1%	-49.9%
2028	-$15.26	-79.9%	-65.6%	-$11.87	-62.1%	-51.0%
2029	-$15.95	-79.9%	-68.8%	-$12.41	-62.1%	-53.5%
2030	-$16.57	-79.9%	-69.7%	-$12.89	-62.1%	-54.2%

Impact on State and Local Tax Revenue



Employment Impacts

Impact on Employment (Units)							
2019		**2025**		**2030**		**2019-2030 AVERAGE**	
10% displacement	30% displacement	10% displacement	30% displacement	10% displacement	30% displacement	10% displacement	30% displacement
-43,000	-33,500	-117,300	-91,200	-147,800	-115,000	-109,500	-85,200
-1.15%	-0.90%	-3.22%	-2.50%	-4.07%	-3.16%		

Employment Impact by Industry as a Percent of Total

Industry	Percentage of Total
Oil and gas extraction	23%
Retail trade	11%
Professional, scientific, and technical services	10%
Health care and social assistance	8%
Construction	7%
Accommodation and food services	6%
State and Local Government	6%
Other services (except public administration)	5%
Administrative, support, waste management, and remediation services	4%
Real estate and rental and leasing	4%
All other Industries	17%

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GSP Impacts

Impact on Gross State Product (GSP) (Billion 2018$)							
2019		**2025**		**2030**		**2019-2030 SUM**	
10% displacement	30% displacement	10% displacement	30% displacement	10% displacement	30% displacement	10% displacement	30% displacement
-$6.216	-$4.836	-$19.386	-$15.077	-$26.312	-$20.462	-$217.926	-$169.486
-1.75%	-1.36%	-5.03%	-3.91%	-6.29%	-4.89%		

COMMON SENSE
Policy Roundtable

Press

THE WALL STREET JOURNAL.

OPINION | REVIEW & OUTLOOK

Colorado's Fracking Fright

Proposition 112 would prohibit almost all new oil and gas production.

By The Editorial Board
Sept. 20, 2018 7:09 p.m. ET

California normally gets all the attention on the front lines of environmental activism. Gov. Jerry Brown recently signed a bill to "decarbonize" all electricity production by 2045. But in real-world implications for the rest of the country, Colorado also deserves attention. A measure heading for the fall ballot would shut down nearly all oil and gas production in one of the top energy-producing states.

coloradopolitics

Opinion

Ballot issue to roll back drilling would kill jobs across Colorado

Author: Robin Wise - September 17, 2018 - *Updated:* September 17, 2018

Robin Wise

In Colorado, we are privileged to live in a state with a thriving economy and abundant opportunity for young people. As the president and CEO of Junior Achievement-Rocky Mountain, nothing gives me more satisfaction than inspiring and preparing young people to succeed in a global economy.

However, this November, future opportunities for all Coloradans are at risk due to a ballot measure that proposes to increase the setback requirement for natural gas and oil development to 2,500 feet – five times the current required distance. Supporters of this measure say passing Proposition 112 will protect public health and safety. The reality is that the Colorado Department of Public Health and Environment (CDPHE), has stated on many occasions there is no "credible evidence" that being any further away from drilling activity is any more protective of public health than

FOX 31 DENVER | 2 COLORADO'S OWN NEWS

Initiative 97 could have big impact on Colorado's economy

POSTED 9:43 PM, AUGUST 30, 2018, BY MATT MAURO, *UPDATED AT 10:54PM, AUGUST 30, 2018*

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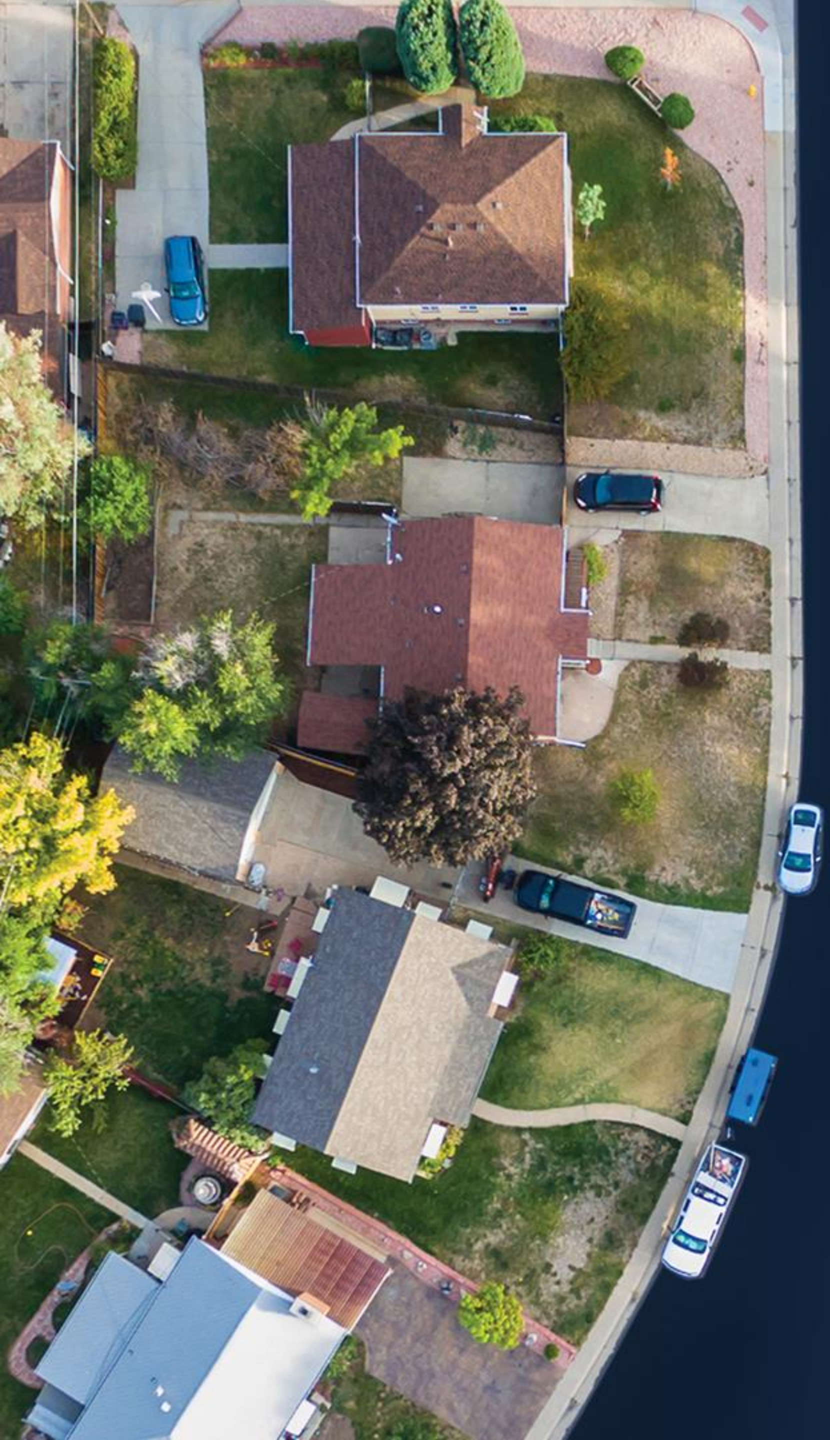

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