

Driving Change: The Economic Impact of Alternative Funding Mechanisms

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Agenda



Introduction

Topic Context

Topic Overview

Model Inputs

Model Results

Conclusion

Q&A

what does *REMI* say?sm

Introduction



In this webinar, we will explore the possible methods for consistent infrastructure funding using REMI's Tax-PI and TranSight models. We will discuss a possible road usage fee in the form of a toll and the funds it would raise; an increase in the gas tax; and the overall economic impacts of each mechanism on a theoretical Colorado economy.



*what does **REMI** say?sm*

Brief History



- **1991** - Colorado increased gas tax to \$0.22/gallon
- **2020** - the Colorado Department of Transportation introduced 25-year statewide plan
- **2021** - Congress passed Infrastructure Investment and Jobs Act
 - the Colorado General Assembly passed SB 21-260

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Why Is This Important?



Economic
Development

Congestion
Costs

Supply
Chain



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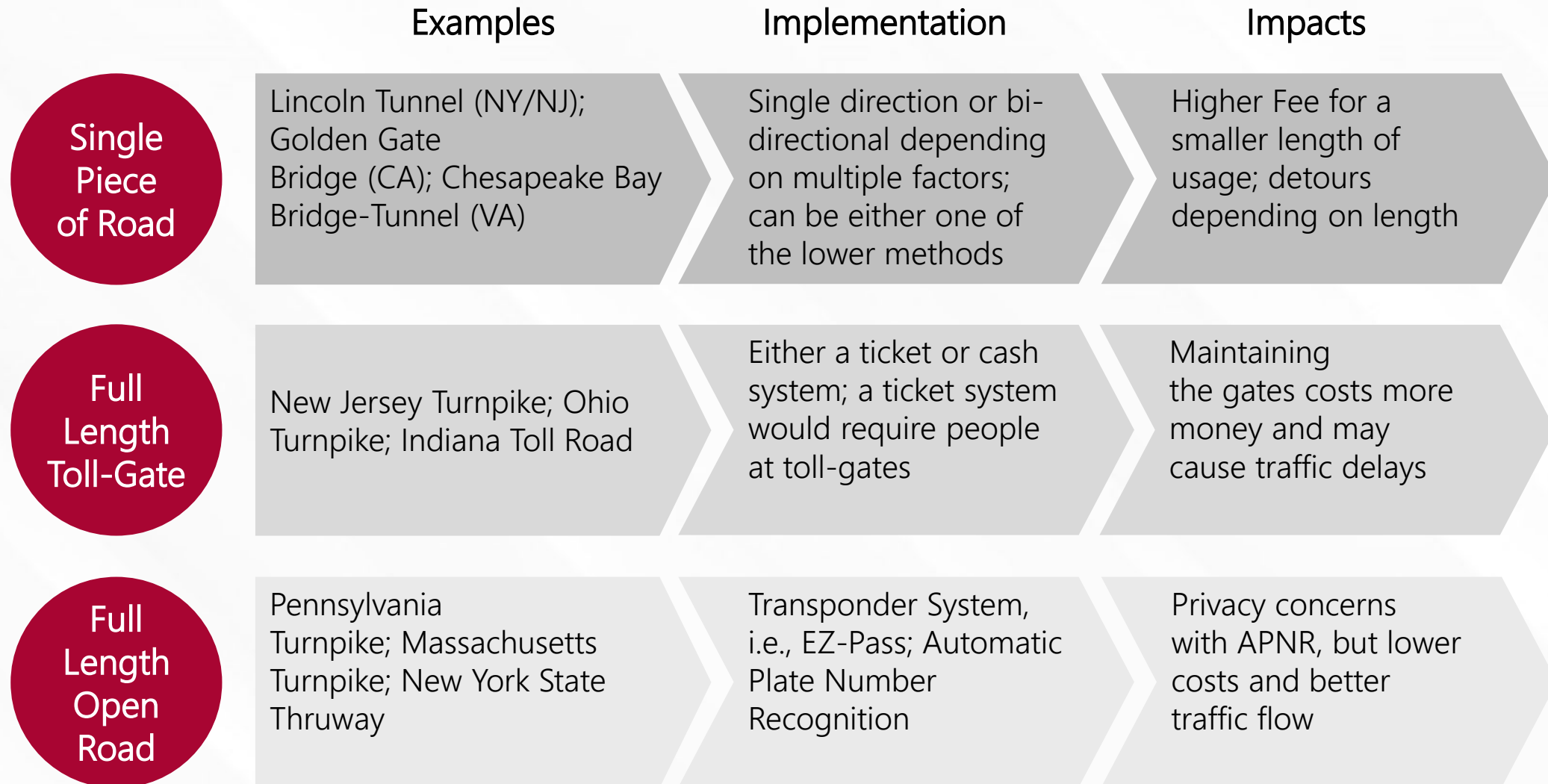
*what does **REMI** say?sm*

3 Possible Road Usage Fees



Virginia: Flat Fee	Utah: Mileage-Based	Nation-Wide: Tolls
<ul style="list-style-type: none">• Done during registration as a formula• Based on fuel efficiency• Only fuel-efficient vehicles pay	<ul style="list-style-type: none">• Flat 1.06 cents per mile up to a flat fee• Flat fee based on fuel-efficiency• Voluntary, so all can participate, fuel-efficient vehicles pay more	<ul style="list-style-type: none">• Single Piece of Infrastructure• Express Lanes• Road itself

Different Types of Tolls



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What is the problem?



With the increased use of electric vehicles and reduced gas tax revenues, there is an increased demand for the support of transportation infrastructure.

Alternative funding mechanisms will be necessary to continue building new infrastructure and maintain current roads, rails, and bridges.

We need excess funds to invest in the maintenance of existing transportation system, built new roadways and infrastructure.

How are we modeling this problem?

3 Funding Scenarios

Alternative Funding Mechanisms



"Do Nothing"

Evaluating the effect of not investing in regional infrastructure



Gas Tax

Evaluating the effect of adding more yearly revenue collected from a tax on gas



Road Usage Fee

Levying a full-length open road toll on I-25 which connects major cities

3 Funding Scenarios Impact Analysis



"Do Nothing" Effect

- Effects on transportation cost in the short, medium and long run
- Lack of investments
- Effect on employment and GDP

Gas Tax Effect

- A shift in consumer habits increasing the demand for EVs
- Increased use of public transportation
- Potential decrease in prices of automobiles and car insurance

Road Usage Fee Effect

- Additional funding for the state
- Increased population base that contribute towards state revenue

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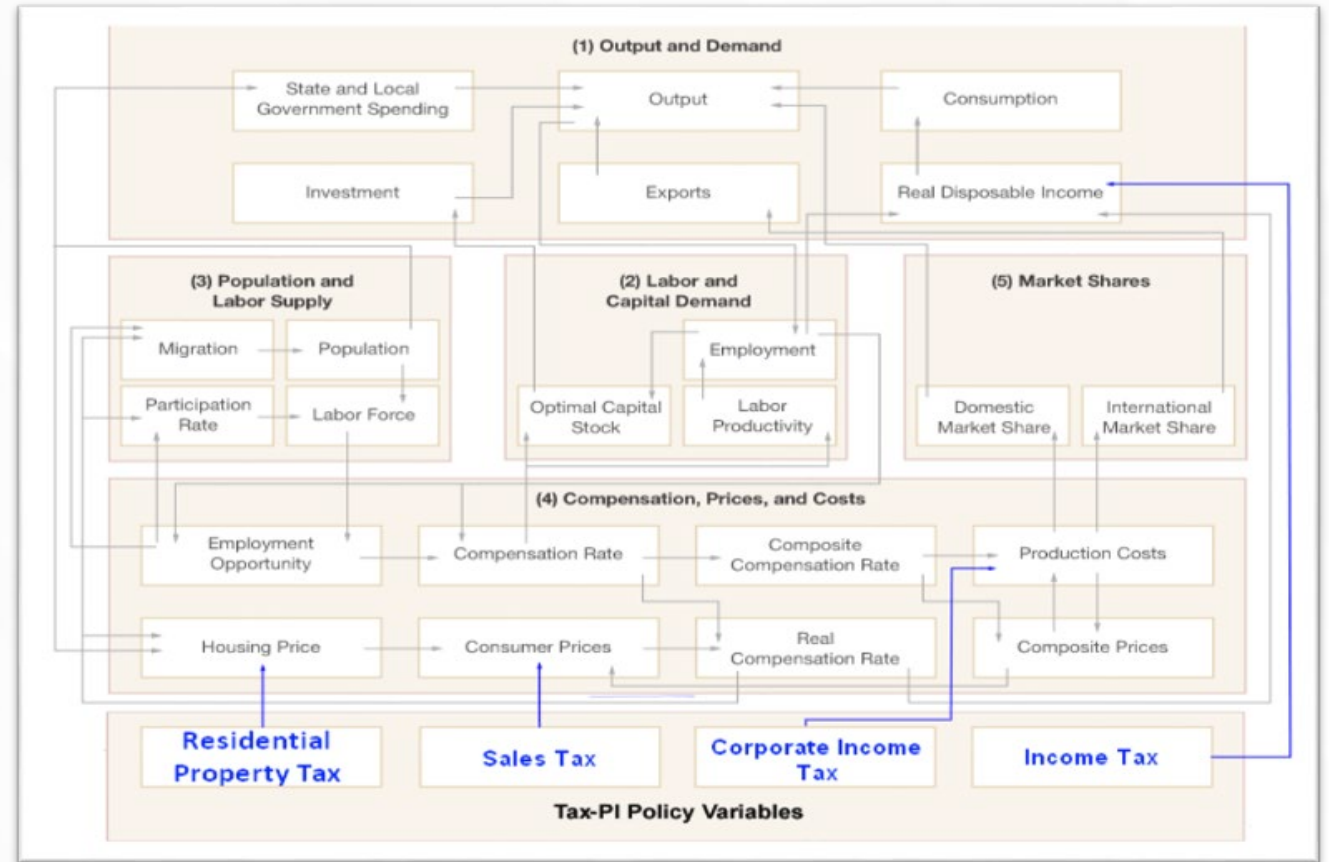
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Model Simulation: REMI Tax-PI



REMI Tax-PI is the only commercially available dynamic macroeconomic and fiscal impact analysis tool.

Tax-PI allows users to understand the deep linkages and relationship between a budget and its economic foundation

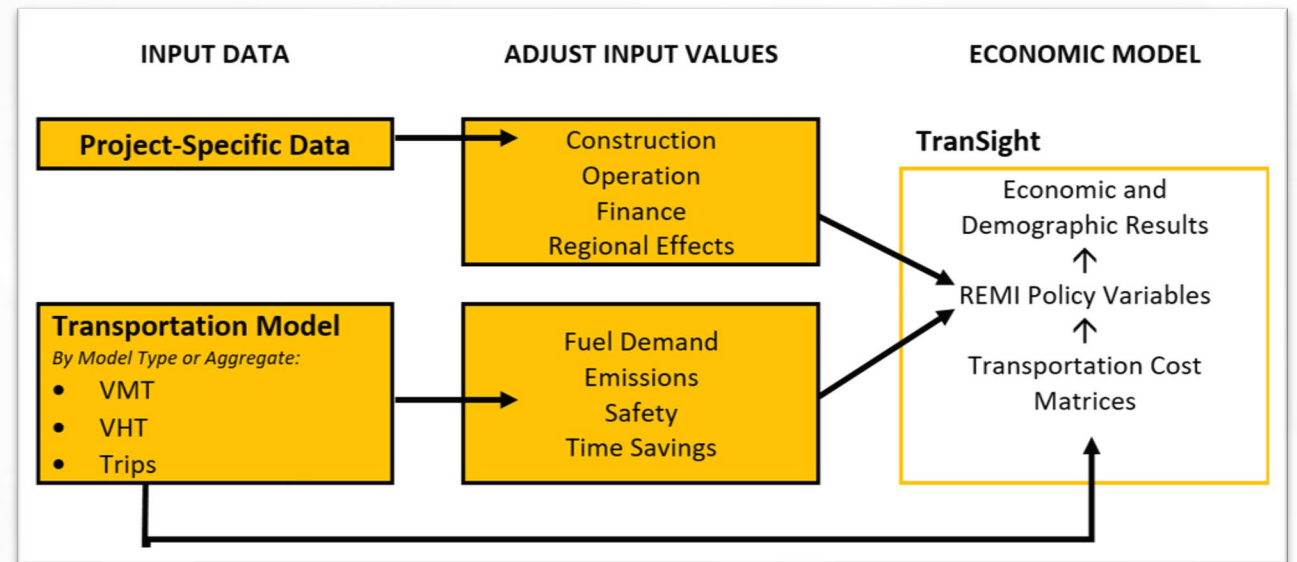


Model Simulation: REMI TranSight



TranSight is the premier software solution for comprehensive evaluations of the total economic effects of transportation policy.

Grounded in over 20 years of modeling experience, decision-makers depend on TranSight to forecast the short-and-long-term impacts of transportation investments on jobs, population, income, and other economic variables



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Control Forecast

- "Business as Usual" Forecast
 - No changes to industry or new indicators
 - Forecast results are measured in differences to the standard control

Revenue Generation Comparison

- Using Policy Variables and Budget Components to Model Custom Scenario
 - Gas Tax vs. Road Usage Fee
 - Capture widespread economic effects in REMI Tax-PI

Value of Network

- Revenue Increases Fund Infrastructure Maintenance in the Region
 - Captures the long-term value of the transportation network
 - Results derived from REMI TranSight

Model Inputs: Budget File - Revenues



Budget Calibration - Budget - Unbalanced in the Forecast

Options Budget Forecast Feedback Aggregations Save Cancel

Budget

Setup a budget by adding revenue and expenditure items and entering budget values. Double-click on an item or press the Edit button to access options for calibrating the budget item's behavior.

Revenues Expenditures

Add Revenue Display Settings

Select which years are displayed on the budget grid

2001 2021 2060

Edit	Revenues	FY2021	FY2022	FY2023
	Sales Tax	5000	5000	5000
	Income Tax	7500	7500	7500
	Coprorate Tax	2500	2500	2500
	Road Usage Fee	500	500	500
	Gas Tax	500	500	500

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Model Inputs: Indicators & Policy Variables



Example: Indicator - Income Tax

Indicator

Select an economic indicator for the budget item. The growth rate of this budget item will be linked to the growth rate of the economic indicator.

Economic Indicator
Personal Income

The economic indicator for this budget item can be customized by adjusting the detail weights. The weights could be used to exclude or partially exclude a detail or the weights could be changed over time to reflect an expected change in revenue or expenditure rates.

Details	Units	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total	Percent	100	100	100	100	100	100	100	100	100	100

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Model Inputs: Indicators & Policy Variables



Example: Policy Variable - Income Tax

Policy Variable

Select a policy variable to associate with the budget item. When a policy variable change is made to this budget item, the associated model variable will automatically be changed. For best results, choose a policy variable that best represents how this budget category works. For example, a sales tax on consumer goods could be matched with the Consumer Price policy variable.

Most policy variables are associated with a relevant result category which is used to spread grouped details. After selecting the variable, enter the percentage of the baseline value for each detail to be used when calculating spreading weights. In the sales tax example, if clothing is taxed at half the rate of other commodities, enter 50. If food is not taxed, enter 0.

Policy Variable
Personal Taxes

Enter the percentage of the baseline value for each detail to be used when calculating spreading weights.

Details	Units	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total	Percent	100	100	100	100	100	100	100	100	100	100	100

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Model Inputs: Budget File - Expenditures



Budget Calibration - Budget - Unbalanced in the Forecast

Options Budget Forecast Feedback Aggregations Save Cancel

Budget

Setup a budget by adding revenue and expenditure items and entering budget values. Double-click on an item or press the Edit button to access options for calibrating the budget item's behavior.

Revenues Expenditures

Add Expenditure Display Settings Select which years are displayed on the budget grid

2001 2021 2060

Edit	Expenditures	FY2021	FY2022	FY2023
	Social Security	10000	10000	10000
	Education	1500	1500	1500
	Justice	2500	2500	2500
	Transportation	2000	2000	2000

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Model Inputs: Indicators & Policy Variables



Example: Indicator - Education Spending

Education
Save Cancel

i
About

📊
Budget Data

📈
Indicator

📄
Policy Variable

? Help

📈 Indicator

💰 Averaging Weights

[\$] Fixed Amount

📈 Relationship

📈 Projections

Indicator

Select an economic indicator for the budget item. The growth rate of this budget item will be linked to the growth rate of the economic indicator.

Economic Indicator

Population (5 Year Age Cohorts)

This indicator will be adjusted for inflation using the Average Annual Compensation Rate for State and Local Government.

The economic indicator for this budget item can be customized by adjusting the detail weights. The weights could be used to exclude or partially exclude a detail or the weights could be changed over time to reflect an expected change in revenue or expenditure rates.

Details	Units	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
▶ Ages 0-4	Percent	50	50	50	50	50	50	50	50	50	50
Ages 5-9	Percent	100	100	100	100	100	100	100	100	100	100
Ages 10-14	Percent	100	100	100	100	100	100	100	100	100	100
Ages 15-19	Percent	100	100	100	100	100	100	100	100	100	100
Ages 20-24	Percent	80	80	80	80	80	80	80	80	80	80
Ages 25-29	Percent	50	50	50	50	50	50	50	50	50	50
Ages 30-34	Percent	20	20	20	20	20	20	20	20	20	20
Ages 35-39	Percent	20	20	20	20	20	20	20	20	20	20
Ages 40-44	Percent	0	0	0	0	0	0	0	0	0	0
Ages 45-49	Percent	0	0	0	0	0	0	0	0	0	0
Ages 50-54	Percent	0	0	0	0	0	0	0	0	0	0
Ages 55-59	Percent	0	0	0	0	0	0	0	0	0	0
Ages 60-64	Percent	0	0	0	0	0	0	0	0	0	0
Ages 65-69	Percent	0	0	0	0	0	0	0	0	0	0
Ages 70-74	Percent	0	0	0	0	0	0	0	0	0	0
Ages 75-79	Percent	0	0	0	0	0	0	0	0	0	0

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Model Inputs: Indicators & Policy Variables



Example: Policy Variable - Education Spending

Education
□ ×

About
 Budget Data
 Indicator
 Policy Variable
 Save
 Cancel

Policy Variable

Select a policy variable to associate with the budget item. When a policy variable change is made to this budget item, the associated model variable will automatically be changed. For best results, choose a policy variable that best represents how this budget category works. For example, a sales tax on consumer goods could be matched with the Consumer Price policy variable.

Most policy variables are associated with a relevant result category which is used to spread grouped details. After selecting the variable, enter the percentage of the baseline value for each detail to be used when calculating spreading weights. In the sales tax example, if clothing is taxed at half the rate of other commodities, enter 50. If food is not taxed, enter 0.

Policy Variable
 State and Local Government Spending

Options

Include Non-Pecuniary (Amenity) Aspects

Include Government Employment

Enter the percentage of the baseline value for each detail to be used when calculating spreading weights.

Details	Units	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
▶ State Government	Percent	100	100	100	100	100	100	100	100	100	100	100
Local Government	Percent	100	100	100	100	100	100	100	100	100	100	100

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Model Inputs: Revenue Changes



Save Forecast Import Export Print Tools

Policy Variable Inputs

Active	Edit	Group			
<input checked="" type="checkbox"/>		New Revenues			
Active	View	Category	Detail	Region	Units
<input checked="" type="checkbox"/>		Custom Revenues	Gas Tax	Colorado	Nominal \$ (M)

2023	2024	2025	2026	2027	2028	2029	2030	...	2060
150	150	150	150	150	150	150	150	...	150

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Model Inputs: Revenue Changes



Save Forecast
 Import
 Export
 Print
 Tools

Policy Variable Inputs

Activ	Edit	Group			
<input checked="" type="checkbox"/>		New Revenues			
Activ	View	Category	Detail	Region	Units
<input checked="" type="checkbox"/>		Custom Revenues	Road Usage Fee	Colorado	Nominal \$ (M)

2023	2024	2025	2026	2027	2028	2029	2030	...	2060
150	150	150	150	150	150	150	150	...	150

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Model Inputs: TranSight Inputs



Policy Variable Inputs

Active	Edit	Group			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cost of Not Raising Either Tax			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cost of Not Raising Either Tax			
Active	View	Category	Detail	Region	Units
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Transportation Costs	Colorado to Colorado	Interregional	Proportion
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Accessibility Costs	Colorado to Colorado	Interregional	Proportion

2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
0	0	0.001	0.0016	0.0022	0.0028	0.0034	0.004	0.0046	0.0052	0.0058	0.0064	0.007	0.0076	0.0082	0.0088	0.0094	0.01	0.01
0	0	0.001	0.0016	0.0022	0.0028	0.0034	0.004	0.0046	0.0052	0.0058	0.0064	0.007	0.0076	0.0082	0.0088	0.0094	0.01	0.01

2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

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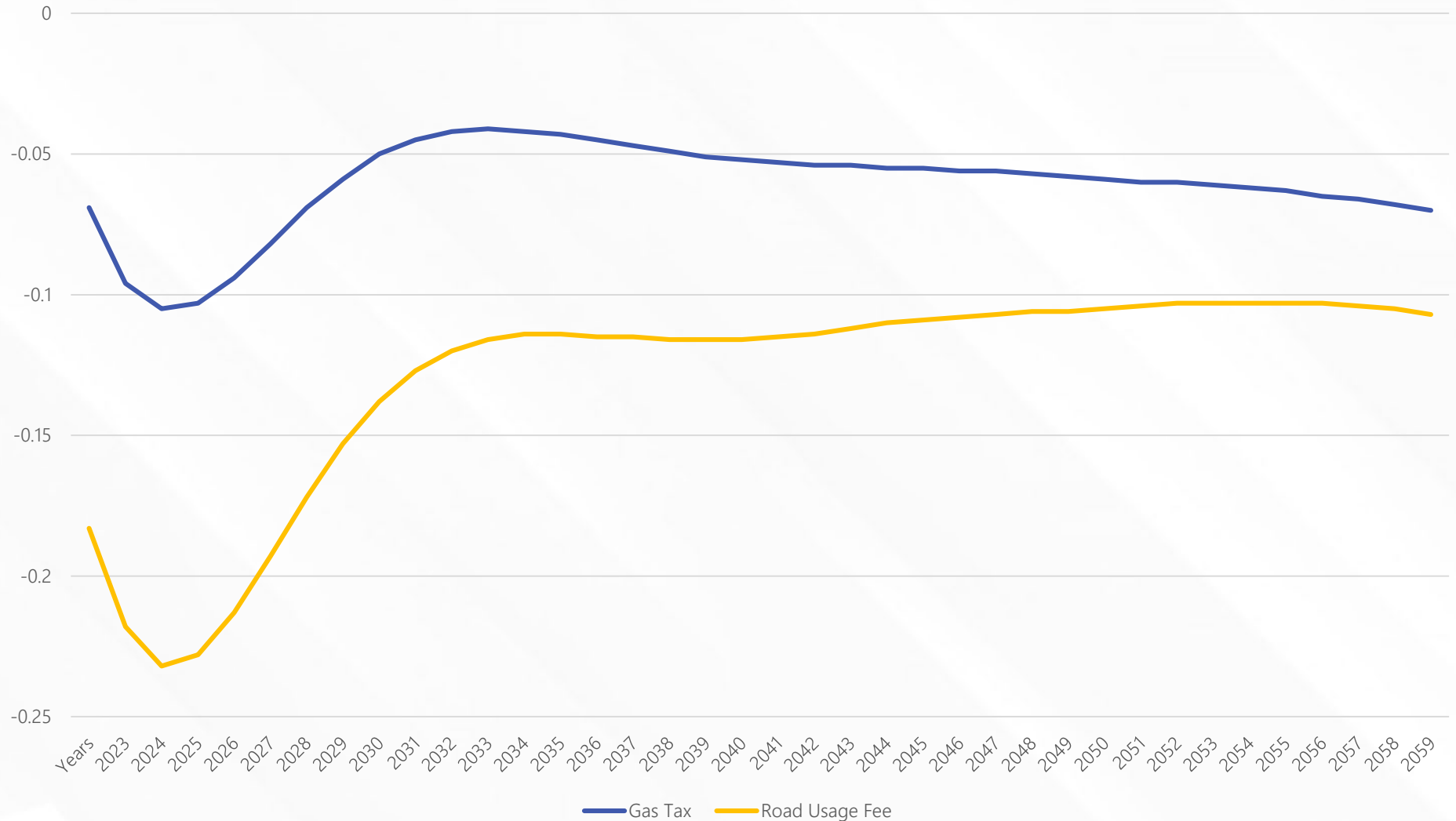
Q&A

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Gas Tax vs RUF: GDP



GDP Comparison



Key Takeaways:

- The GDP takes an initial dip when both taxes go into effect
- After its initial recovery, the Gas Tax GDP starts to decline over time while the RUF GDP sustains itself

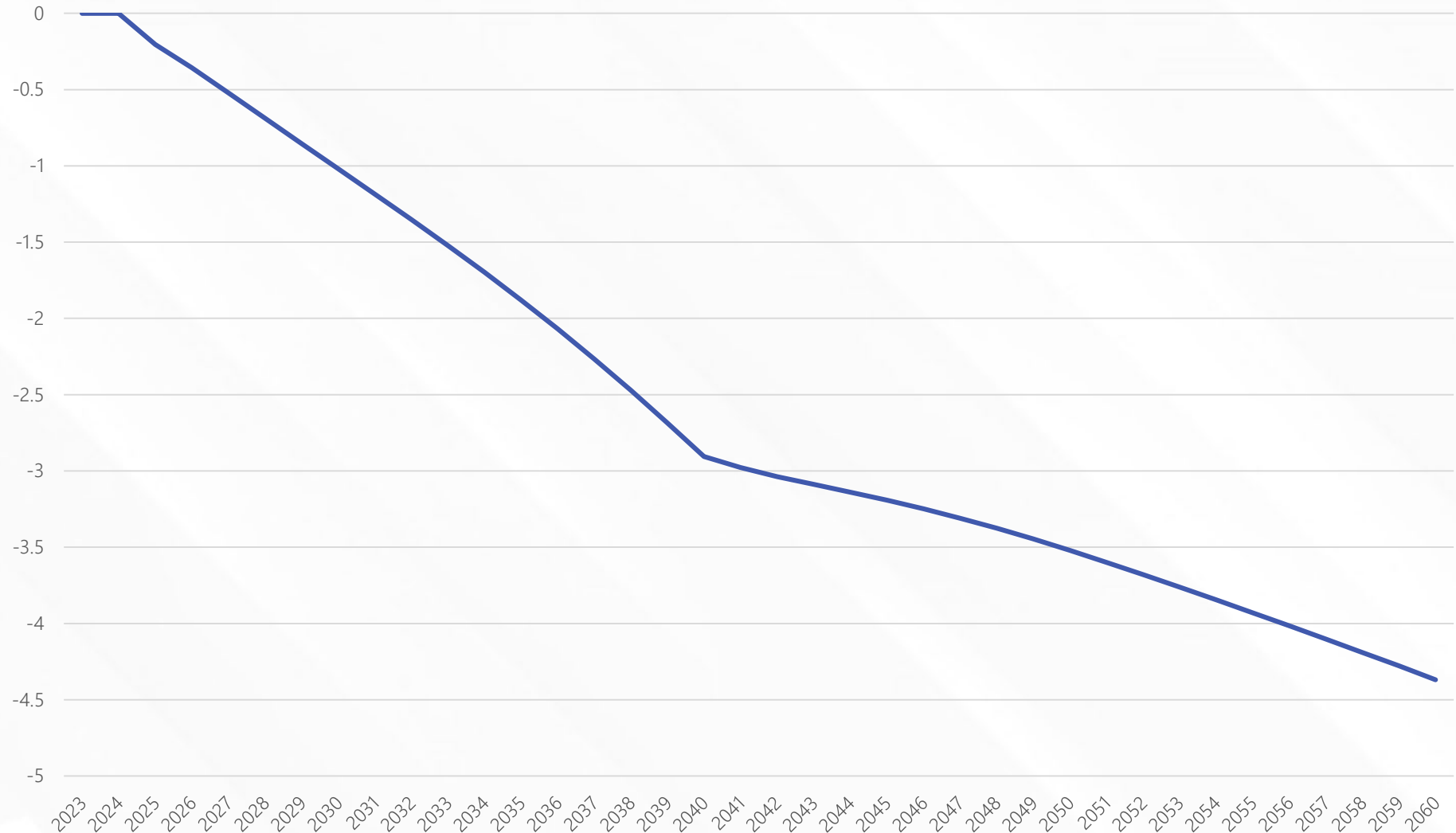
Y Axis: Billions of Fixed \$

X Axis: Years

"Do Nothing" Scenario: GDP



GDP: Neither Revenue Increase



Key Takeaways:

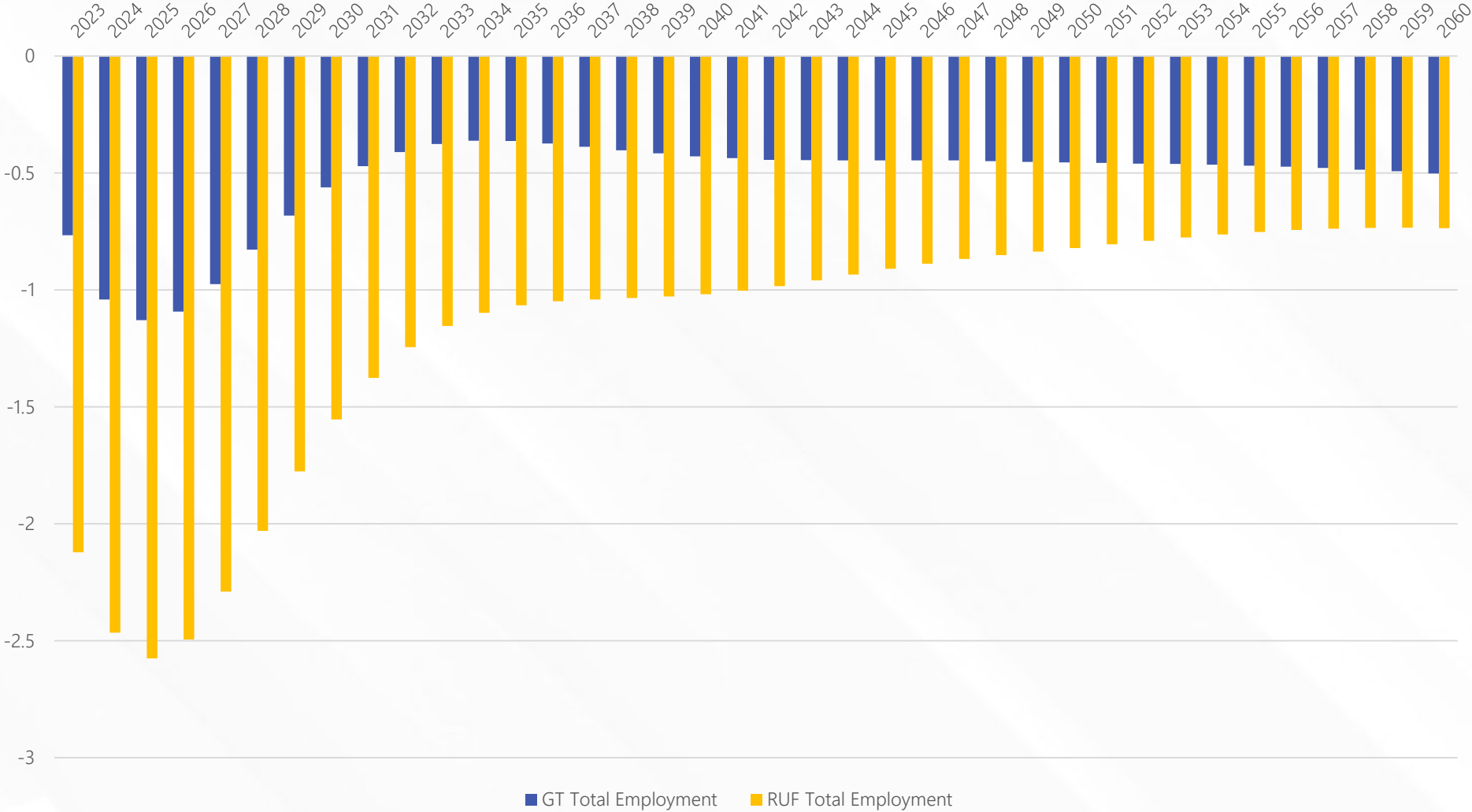
- GDP will not recover from the lack of infrastructure funding on its own
- It's important to note this scenario does not include the reinvestment of collected funds

Y Axis: Billions of Fixed \$
X Axis: Years

Gas Tax vs RUF: Employment



Employment Comparison No Investment



Key Takeaways:

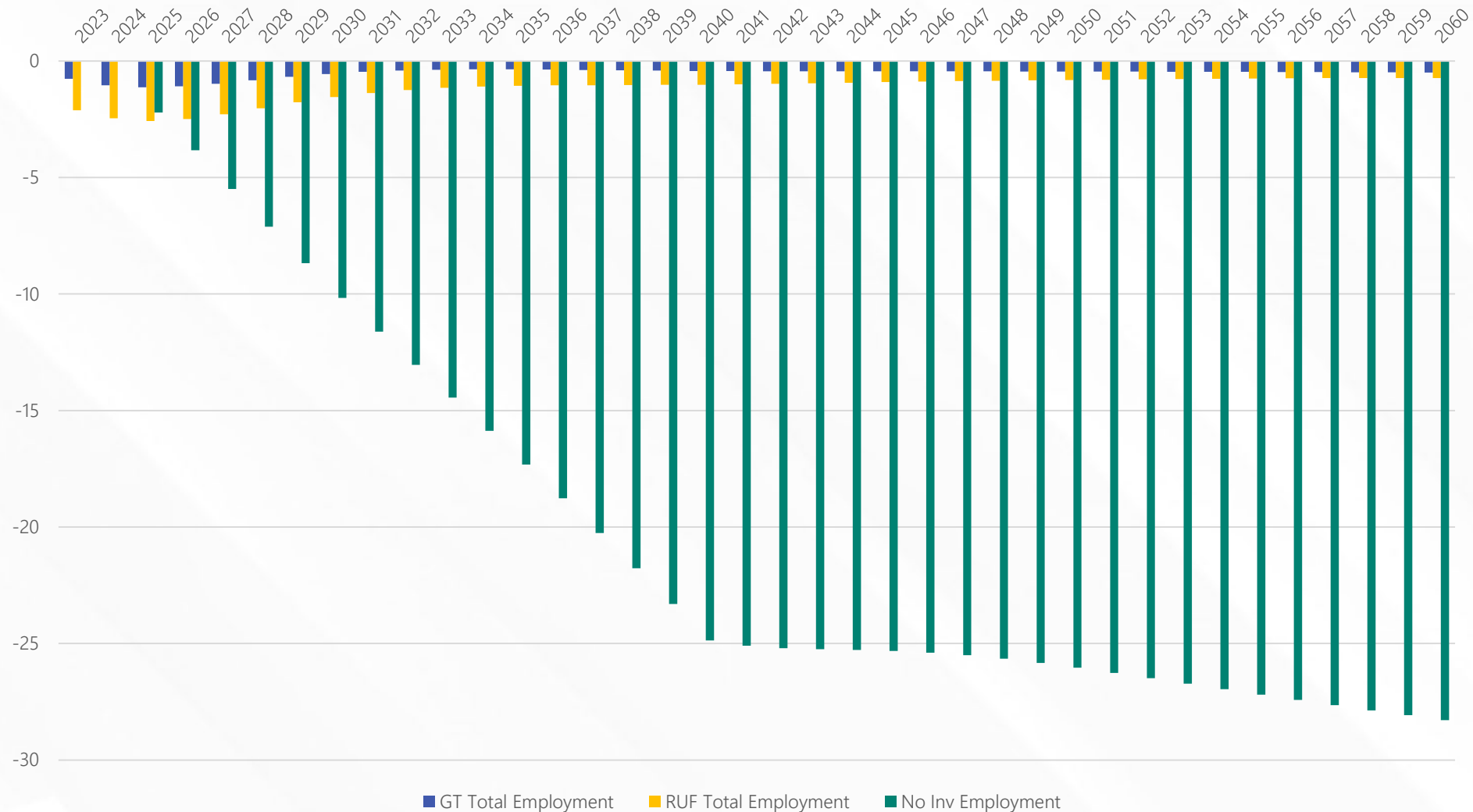
- Similar to the GDP graph, both the gas tax and RUF take a dive
- However, the RUF shows an increasing trend at a faster rate than the gas tax. While the gas tax starts decreasing after 2036

Y Axis: Thousands of Jobs
X Axis: Years

"Do Nothing" Scenario: Employment



Employment Comparison Including No Investment



Key Takeaway:

- While employment does take a considerable hit with the gas tax & RUF, it is considerably less compared to the scenario where there is no investment

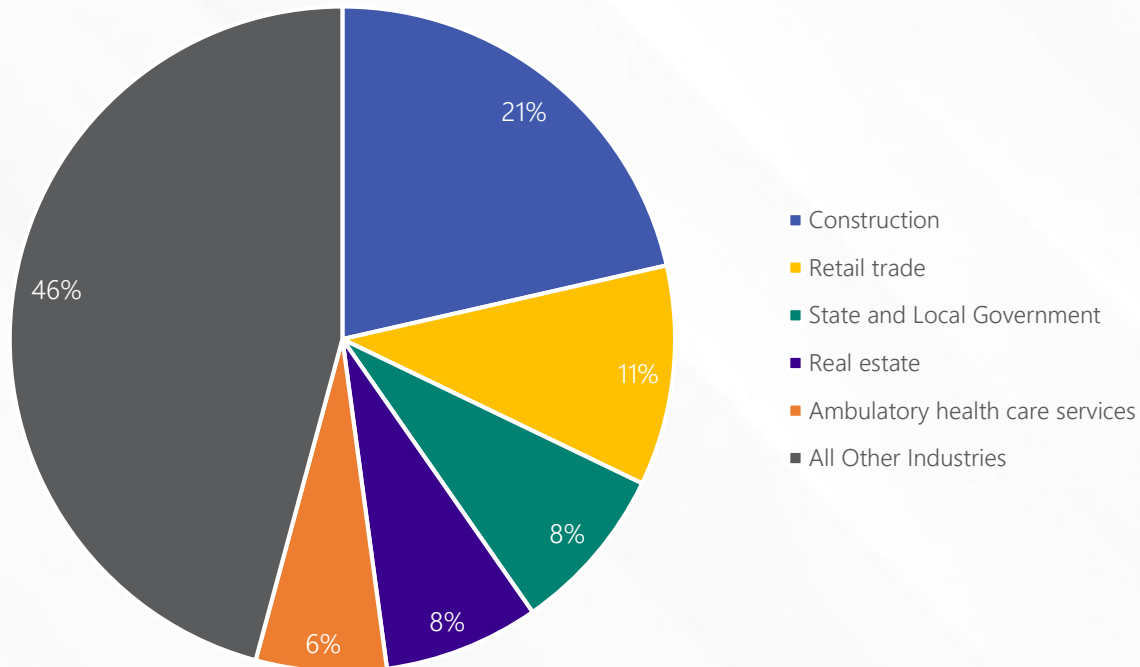
Y Axis: Thousands of Jobs

X Axis: Years

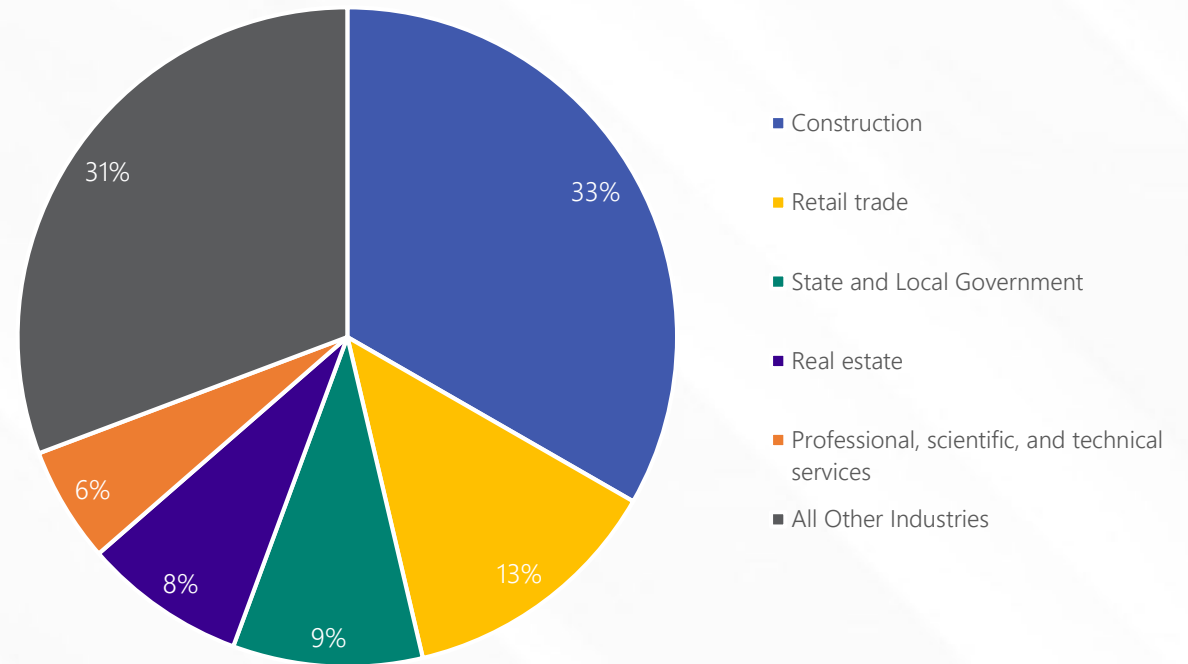
Gas Tax Vs. RUF: - Employment Breakdown (Y2025)



Road Usage Fee



Gas Tax



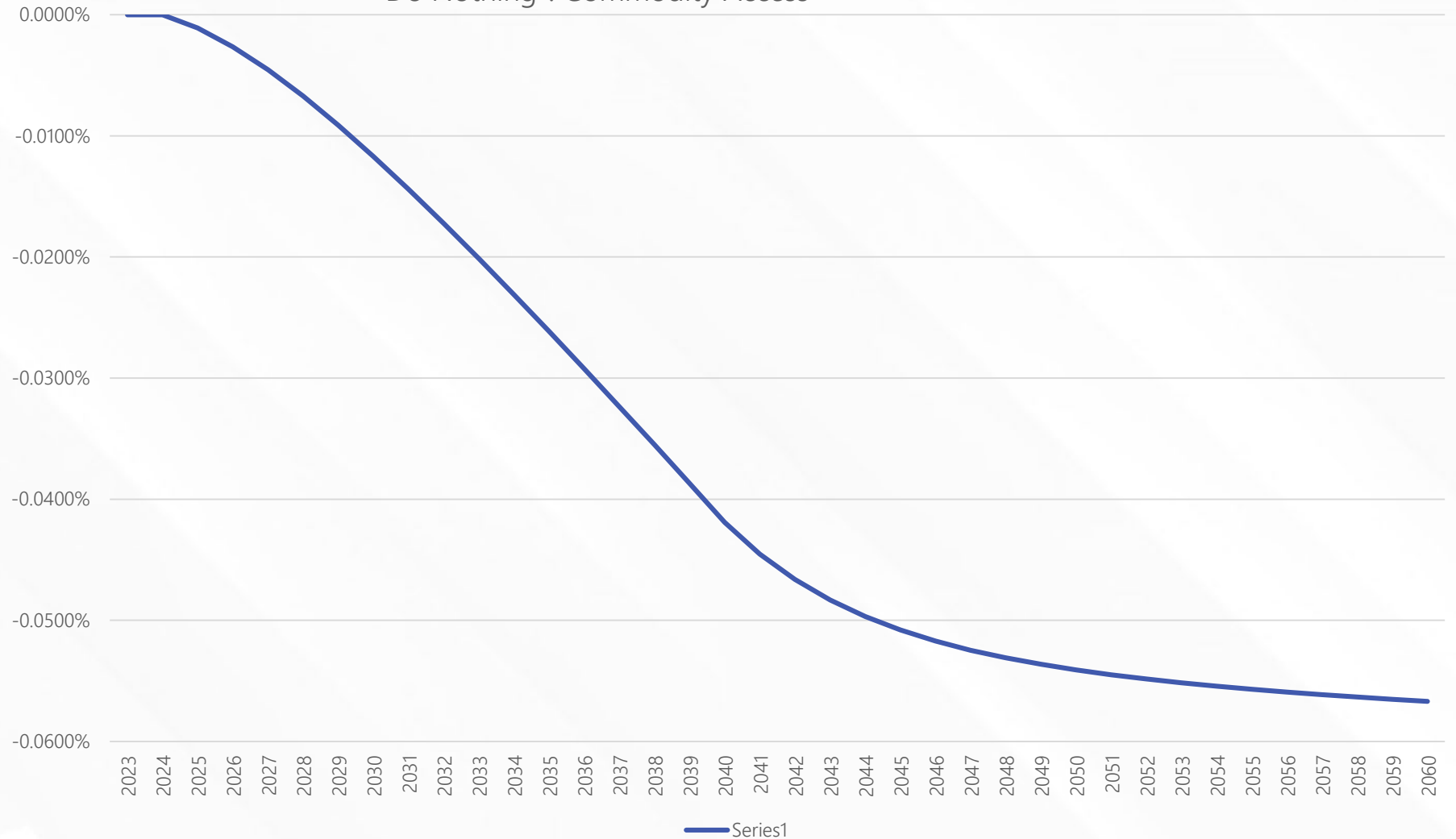
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From REMI Tax-PI

"Do Nothing" Scenario: Commodity Access Index



"Do Nothing": Commodity Access



Key Takeaway:

- As commodity access decreases due to people not being able to access businesses, prices of commodities will be expected to increase

Y Axis: Percent Decrease
X Axis: Years

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- There is no "right answer" on which revenue stream is more effective, they each impact the regional economy in a uniquely different way
- A miniscule increase in transportation costs leads to long-term economic loss, which is representative of what would happen if there is insufficient funding to pay for transportation infrastructure
- Evaluating simulations like this are useful in performing long-term economic impact analysis

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Thank you for attending!

For more information, please contact
info@remi.com