

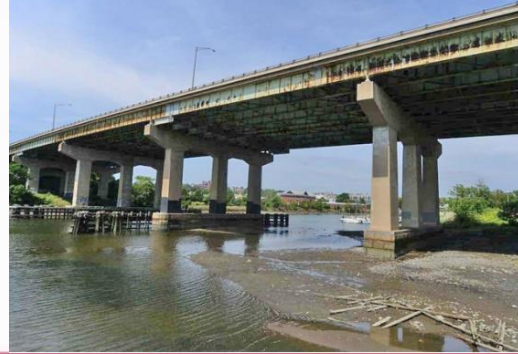
Economic Modeling and Biden's \$2.3 Trillion Infrastructure Plan

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The Problem



*Yankee Doodle
Bridge, Norwalk CT*

- **56,000** structurally deficient bridges.
- **15,000** high-hazard dams
- **One million** water pipes one hundred years old
- Aging electric transmission and distribution
- **\$836 Billion** backlog of capital needs for highways (USDOT)
- Schools, Transit, Solid Waste
- Airports, Inland Waterways, Levees, Ports, Rail*

*source: ASCE 2017 Infrastructure Report Card

For example...



LA-1, in Louisiana just inland from the Gulf of Mexico

I-95 and the Pennsylvania Turnpike, near Philadelphia PA



what does REMI say? sm

But....

- Infrastructure is **popular**; how to pay is **unpopular**
- Generally, **Republicans** oppose tax increases;
Democrats oppose flat/regressive taxes
- Lack of public confidence that **taxes** will be well-spent:
 - Perception that spending is driven by politics rather than return on investment

(inherent tension between **distribution of funding** and **return on investment**)

Importance of economic modeling

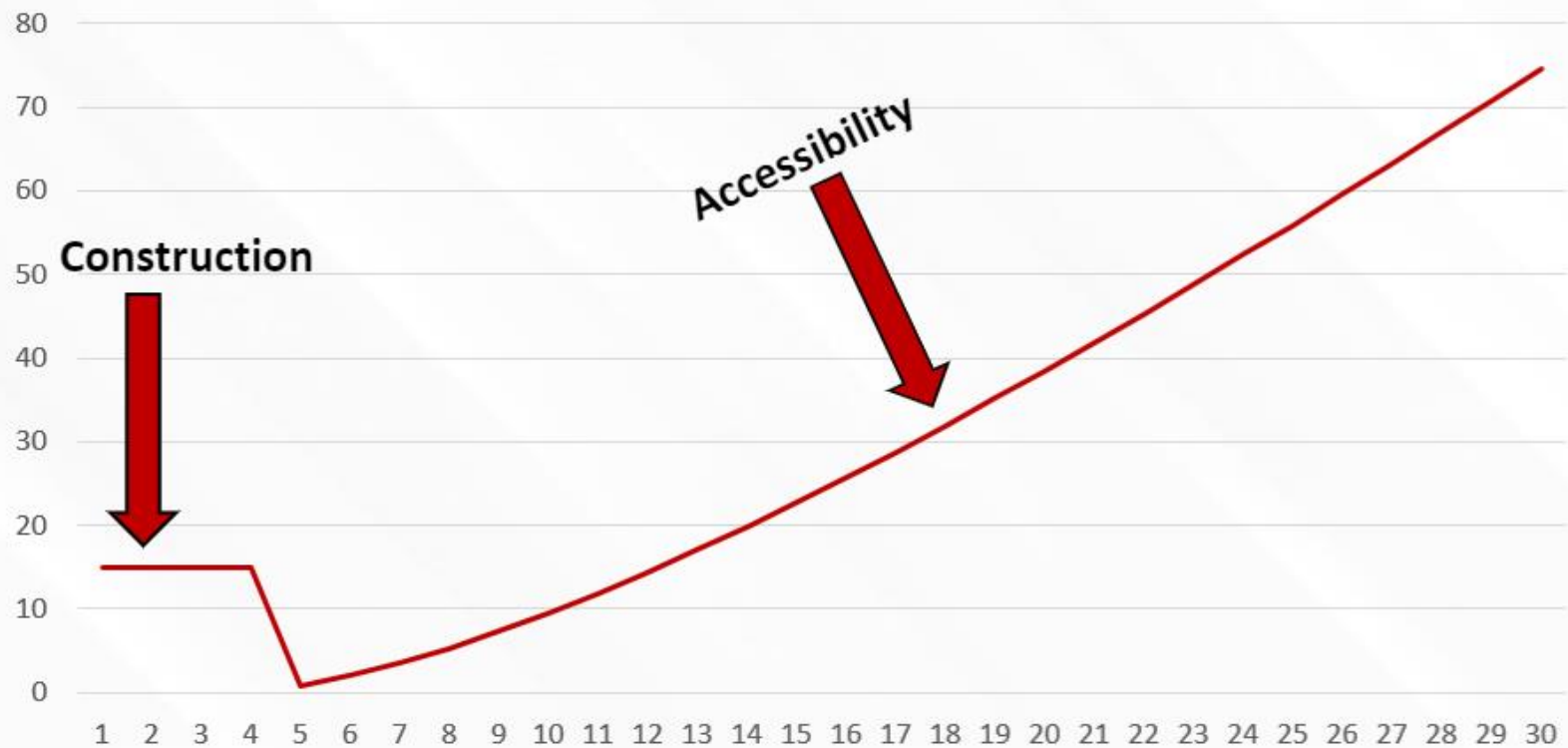
- **Clarify:** modeling provides a structure to understand the relationship between infrastructure investment and the economy
- **Calculate:** modeling quantifies project objectives (economic growth, jobs, regional and socio-economic equity)
- **Communicate:** modeling provides key information to stakeholders and the public

- ✓ Get policy right
- ✓ Pass / block legislation
- ✓ Modernize and advance your agency
- ✓ Formalize your decision-making process

A Pivotal Moment

- Massive Federal Funds: **CARES Act, ARP**, pending **infrastructure bill**
- Use of Funds: **Squandered** or **Invested** in the Future?
- **Economic Modeling:**
 - Evaluating Projects
 - Prioritizing Projects
 - Formalized Approach to Project Selection
- Opportunity knocks but once

Sample Project



what does **REMI** say?sm

Static vs. dynamic analysis

Static Analysis

- Construction spending
- O&M spending

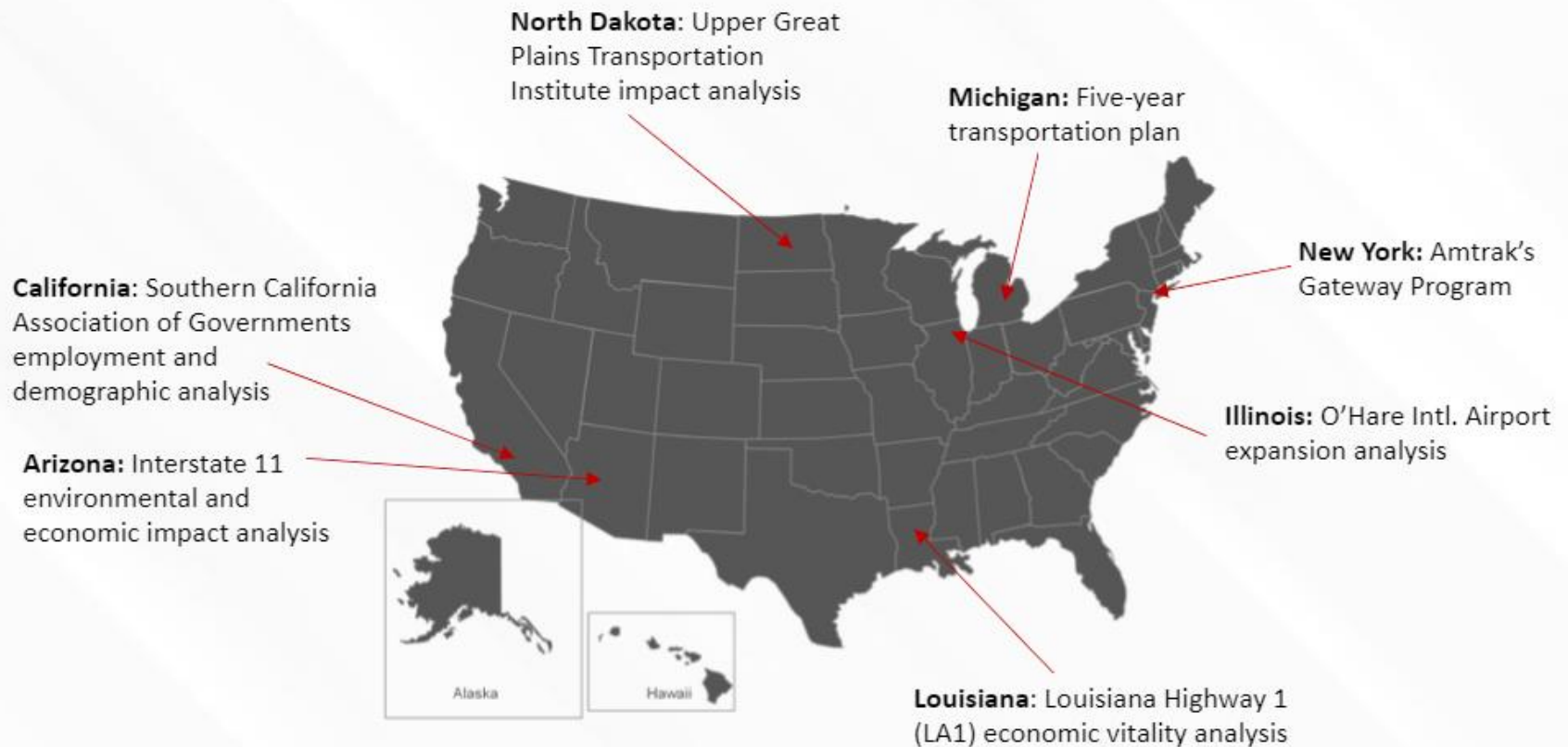
Dynamic Analysis

- Construction spending
- O&M spending
- Travel time savings
- Emissions savings
- Safety improvements
- Fuel expenditures
- Non-fuel VOCs
- Network speed improvements
- Access to labor
- Access to intermediate inputs

FHWA: TranSight is among the “best equipped to estimate *productivity* impacts”*

*USDOT Federal Highway Administration, “Measuring the Impacts of Freight Transportation Improvements on the Economy and Competitiveness.”

Examples of REMI projects



Scenario 1: Transportation Infrastructure



- **Data:** The President's plan invests \$621 billion in transportation infrastructure and resilience over 8 years.
- **Study Period:** 2022-2030
- **Model Inputs:**
 1. Investment in transportation infrastructure \$77.625 billion per year
 2. Increase labor access index by 0.25% in 2022, 0.5% in 2023, 0.75% in 2024, 1% from 2025 to 2029
 3. Increase corporate tax to cover the investment by \$41.4 billion per year

Scenario 2:

New Brent Spence Bridge



- **Data:** One plan, with costs estimated at \$2.6 billion, would involve building a new bridge alongside the existing span and making other road improvements on both sides of the Kentucky-Ohio border.
- **Study Period:** 2022-2030
- **Model Inputs:**
 1. Investment in bridge project by \$0.86 billion each year from 2022-2024
 2. Increase labor accessibility gradually from 2022-2030
 3. Increase commodity accessibility gradually from 2022-2030
 4. Increase corporate tax to fund the project

The American Jobs Plan



*What's
in the
bill?*

*How will
Biden
pay for
it?*



What's in the bill

- Highest level:
 - **Physical** Infrastructure (roads, bridges, etc.)
 - **Energy** Infrastructure (energy & environmental effects)
 - “**Human** Infrastructure” (human resources/services)
- An expected second package, the **American Families Plan**, will include more “human infrastructure”



What's in the plan, detailed

- Transportation - **\$621** billion
- Home care services and workforce - **\$400** billion
- Manufacturing - **\$300** billion
- Housing - **\$213** billion
- Research and Development - **\$180** billion
- Water - **\$111** billion
- Schools - **\$100** billion
- Digital infrastructure - **\$100** billion
- Workforce development - **\$100** billion
- Veteran's hospitals and federal buildings - **\$18** billion

A long time coming

- Infrastructure in **disrepair** is visible to the everyday American, front & center in their minds
 - American Society of Civil Engineers gave U.S. infrastructure a grade of **C-**, recommended **\$2.6 trillion** in repairs
 - Even the **private sector** is beginning to call for infrastructure investments, as we'll see later
- No major infrastructure package for **20+ years**
- Is this the time to go **big & bold**, propel the U.S. out of recession?
- Rural America is held back without **broadband**
 - Plus a national need to **keep up** in a rapidly modernizing world
- The necessity (& opportunity) to invest in **climate**

Planning and investing in a time of rapid change



- Core infrastructure needs (roads/bridges, water, schools) need **repair & upgrade**
- **New categories** of infrastructure: e.g. broadband internet, intelligent transportation systems
- **Private sector enthusiasm** (stock market) to invest in new technologies: renewables, semiconductors, EVs
 - Biden's bill supports these industries, and further R&D
- Federal, state, & metropolitan **governmental agencies** cannot ignore these fundamental shifts
- Uncertainty requires **simulation & modeling** (economic, technological, post-COVID structural shifts)

Physical infrastructure

John A. Roebling Bridge

- Historic landmark in Kentucky, **155 years old** (built in 1866)
- Carries **8,100** vehicles/day
- Closed many times in the last decade – literally crumbling!

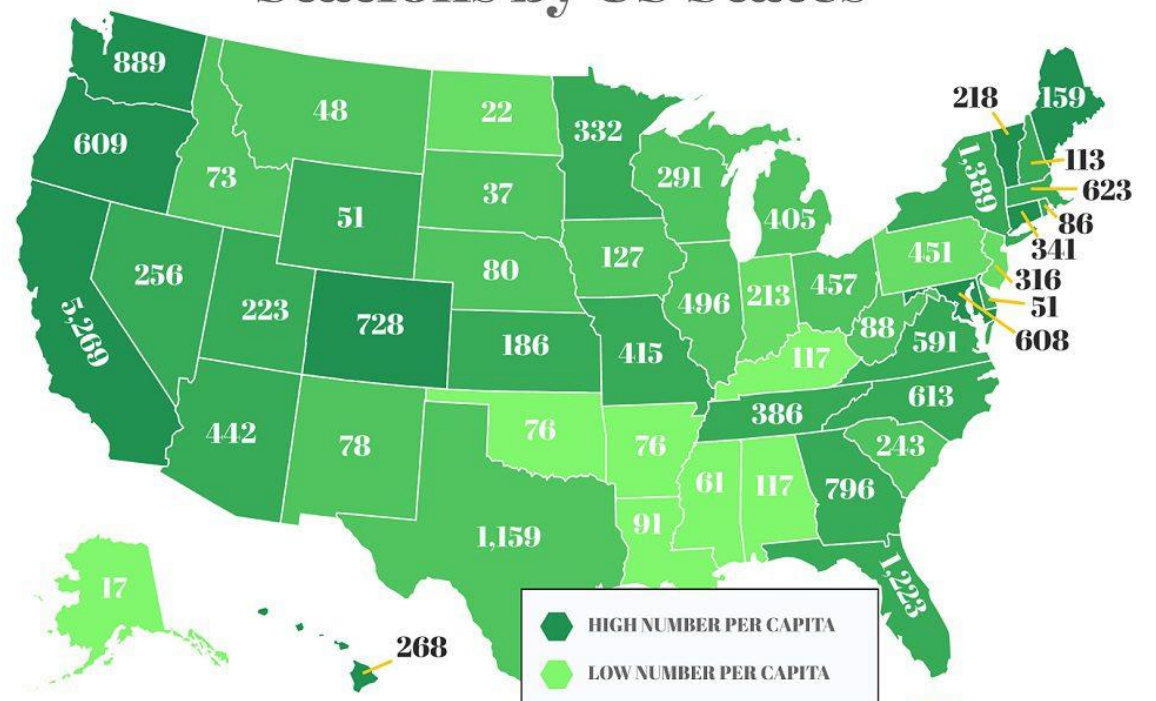


Network of **EV charging stations**

- Unlocks the EV market for the private sector
- Raises national productivity

EV charging stations, demo

Electric Vehicle Charging Stations by US States



TonyMAPPEDit.com

Source data: [Alternative Fuels Data Center](#),
[U.S. DOE](#)

- A public good
- Eliminates the biggest **barrier to entry** for EV
- Long term, EV has lower **operations costs** than gas
 - So, more **consumer spending** elsewhere!
 - Increased **productivity**
- Some **jobs** gained in construction, some jobs lost in oil & gas
- Keeps U.S. automakers **competitive** internationally

what does REMI say? sm

Scenario 3:

EV production & charger station construction

- **Data:**

1. General Motors will convert an ageing Detroit assembly plant into the manufacturing heart of its “all-electric future” and create 2,200 jobs
2. President Biden plans to build a national network of 500,000 EV chargers by 2030

- **Study Period:** 2022-2030

- **Model Inputs:**

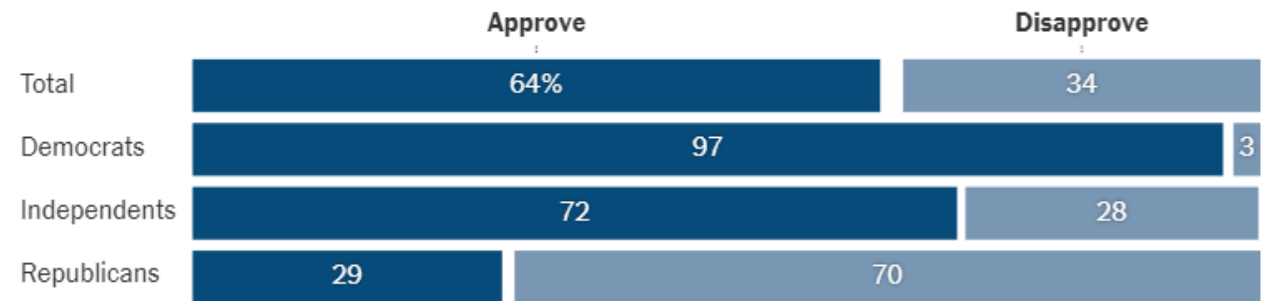
1. increase Motor Vehicle industry output in Michigan; decrease 50% of the same amount in the rest of the U.S.
2. consumer spending shift from motor vehicle fuels to electricity
3. construction of 500,000 EV chargers by 2030, around \$5 billion investment; fund by corporate tax increase

Public reception to the bill

- Roughly half of Americans support the bill
 - Within the last 3 weeks, *Times* says **64%**, *CNBC* says **36%**, *Quinnipiac* says **53%**, *Yahoo News/YouGov* says **51%**
 - However, when each part of the bill is polled on its own, support increases dramatically

*The bigger question:
Do the American
people trust their
gov't to invest well?*

Do you approve or disapprove of the American Jobs Plan?



Corporate reception to the bill

- Some companies are already mobilizing to resist a raise to the corporate tax rate
 - Especially corporations in the **oil & gas** industry, **RATE coalition**, & **Business Roundtable**
- A group of companies (incl. **Amazon, Facebook, Google, Uber**; mostly tech & delivery) have come out in support of the plan – *AND* corporate tax hike
 - **JP Morgan** also advocates for a higher U.S. corporate tax rate
- We're seeing more & more of these **corporate letters** to Biden urging him to be bolder
 - See the letter requesting Biden double his U.S. emissions reduction pledge at today's summit, or the letter from **electric power companies** that Biden limit emissions

How will Biden pay for it?

- **Increase corporate tax rate** from 21% to **28%**
 - (2017 Trump tax cuts lowered rate from 35% to 21%)
 - Will GDP suffer in the short term due to this increase?
- Closing **tax loopholes**
- **Global tax rate / penalties** for manufacturing abroad
- Notably absent from the discussion: *gas tax*
 - Or other “user fees” that charge per use rather than blanket
- Also notably absent from the discussion: *carbon tax*
 - Both Biden & Janet Yellen (and, recently, oil companies) have said they would support a carbon tax

How will it pay for itself?

- Infrastructure always **takes a while** to pay for itself
 - Nontraditional, “human infrastructure” may take longer to pay for itself (according to Bank of America)
- Is the bill **too Spartan**, or a “**Trojan horse**”?
- The federal government is just borrowing money to pay for it up front; when will the plan’s returns outweigh the initial investment?
 - **Dynamic scoring in reverse:** rather than cutting taxes to boost revenues, Biden proposes we boost revenues by borrowing
 - REMI Transight/Tax-PI models used in Louisiana to show that highway investment **pays for itself** with increased tax revenue

The path to becoming law

- Through **budget reconciliation**
 - Senate Parliamentarian Elizabeth MacDonough
 - No real chance to pass the bill as-is without reconciliation, unless Democrats scrap the filibuster
 - Large chunks of the bill may get sidelined this way
- Any room for **compromise** with Republicans?
 - Some have said a corporate tax increase is a “nonstarter”; yet, grassroots constituent demand to fix crumbling bridges and won't want to be disappointed again.
- Deadline of **September 30** to pass the bill

Conclusion

- There is a **real need** for infrastructure investment
 - Private sector, public sector, & individuals have been asking...
 - No major bill for years
- The success of the infrastructure plan depends on how the funds are used on a **project-specific** basis
 - Ultimately, the responsibility lies with **state & local gov't**
 - The American Jobs Plan is **bold**; will it succeed?
- The value of modeling to **clarify, calculate, communicate**
 - Project prioritization
 - Quantify jobs & economic activity
 - Modeling provides a quantified narrative to engage stakeholders

Q&A

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The End!

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About Us

Regional Economic Models, Inc. (REMI) was founded in 1980 on a transformative idea:
government decision-makers should test the economic effects of their policies before they're implemented. We are the nation's leader in dynamic local, state and national policy modeling. Our clients use REMI models to perform rigorous economic analysis that critically influences local, state and national policies.

OUR CLIENTS:

Sandia National Laboratories • Ernst & Young • Texas Comptroller
University of Michigan • Tennessee Valley Authority • National Education Association
South Coast Air Quality Management District • North Carolina Department of Commerce
Wyoming Department of Administration & Information

REMI Model

Data sources: BLS, BEA, CBO, Census Bureau

New **RSQE** Macroeconomic Update

- The U.S. Economic Outlook for 2020-2022 from the **University of Michigan's** Research Seminar in Quantitative Economics (RSQE).
- An update to the Economics Outlook from CBO
- **Includes the \$1.9 trillion** stimulus package passed last month

Results REMI can show

- Jobs created, & the quality of those jobs
- Economic growth generated, in the short- & long-term
- Regional geographic shifts due to changing industries
- Carbon emissions
- Workforce productivity
- Cost of increasing corporate tax rate

Model methodology

REMI's 40-year history of rigorous academic research and software development has led to the development of the industry standard in macroeconomic research methodology:

General Equilibrium

(estimates the long-run stability of the economy)

Input-Output

Econometrics

(advanced statistical analyses)

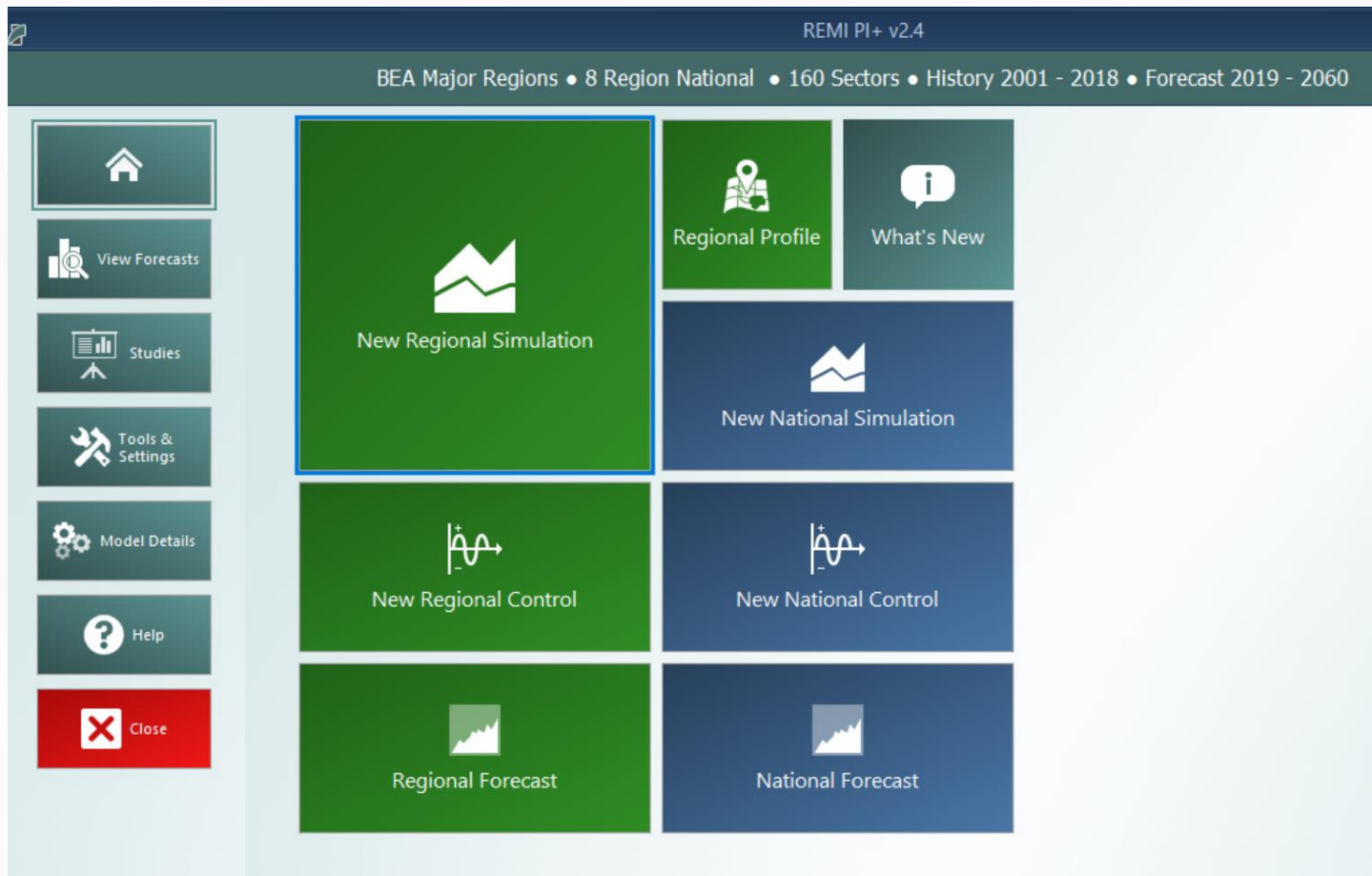
Economic Geography

(regional effects due to geographic concentration of labor & industry)



**Integrated REMI
economic modeling
approach**

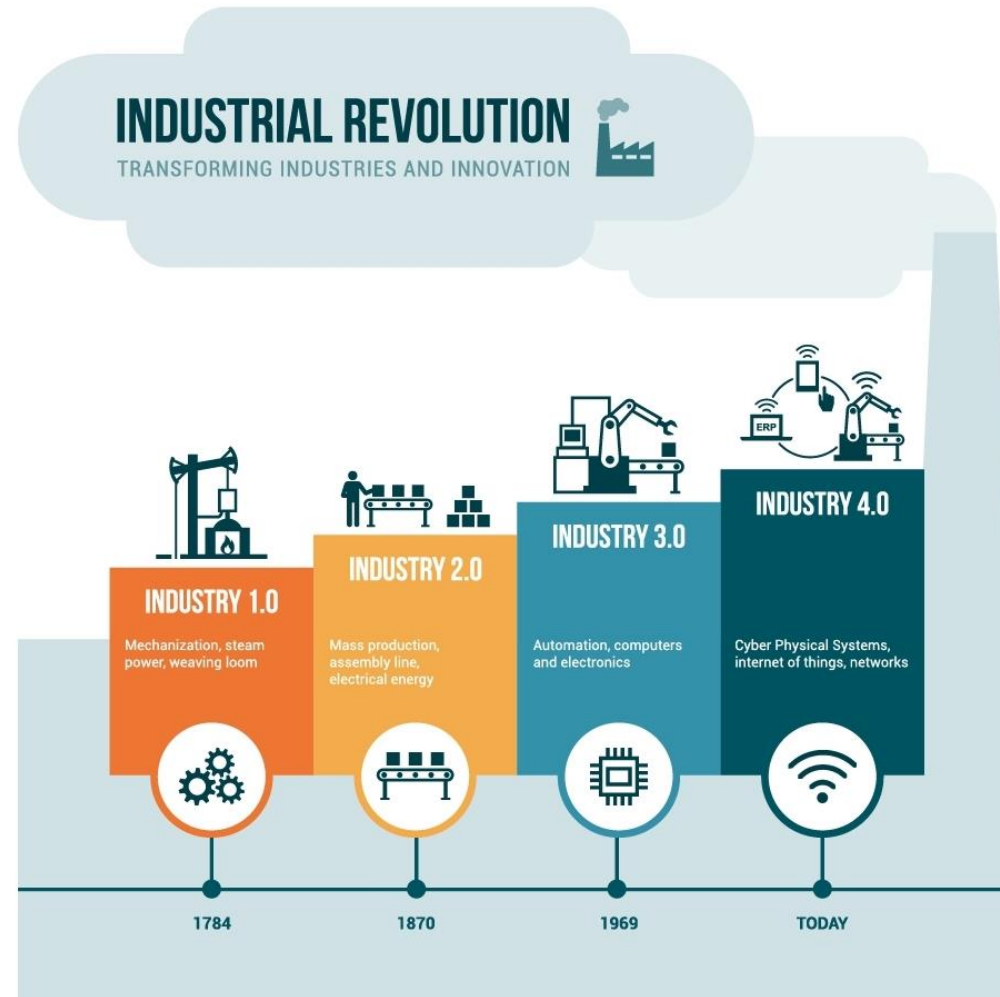
Model demonstration



what does **REMI** say?sm

At the cusp of a revolution

- The dawn of the 4th Industrial Revolution
 - 1st Revolution – harnessing water/steam (& coal)
 - 2nd Revolution – harnessing electric power
 - 3rd Revolution – automation through electronics & IT



What even is “infrastructure?”

- Biden admin’s new phrase “**human infrastructure**”
 - **Partisan** debates over what falls under the term
 - **Procedural** debate over whether “human infrastructure” can even be passed as part of an infrastructure bill, or through the process of budget reconciliation
- For today, focus on traditional (roads) and extended (broadband, charging stations) physical infrastructure
- Note: transportation infrastructure modeling has a high level of **uncertainty**
 - Payoffs are a long way off
 - Payoffs are dependent on consumers’ behavioral trends
 - Each project is different, requires unique analysis

“Human infrastructure”



\$25 billion to **childcare**

- Should also increase the country's productivity
- Will benefit women most

\$400 billion on **home care for the elderly**

- Filling the employment void left by automation
- Necessary to deal with an ageing population

what does **REMI** say? sm



Possible scenarios

- If passed, the bill will empower private industries in rapidly growing sectors; **some will win big**
- A country united by networks of high-speed **broadband** internet and EV **charging stations**
 - EV market “unlocked”
- Possible **regional economic shifts** due to opening new power plants, closing obsolete ones
- A revitalized **system of roads & bridges** that reduces traffic jams & otherwise promotes productivity
- A moderately **depressed economic impact** due to a higher corporate tax rate?
- Lots of **construction** over the next decade!